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## USSR LOTTERIES DISCUSSED

Moscow FINANSY SSSR in Russian No 6, Aug 79 pp 71-74

[Article based on source material of V.I. Bulkin, deputy chief of Department of Credit and Monetary Circulation of the USSR Ministry of Finance: "Lotteries in the USSR"]

[Text] Letters come to the editorial office in which readers disclose their interest in lotteries held in the USSR. V.I. Bulkin, deputy chief of the Department of Credit and Monetary Circulation of the USSR Ministry of Finance, describes their types and manner of conducting them.

Lotteries in the USSR have their own history. In the first years of the Soviet power, they bore the character of simple lotteries and were organized by local soviet and public organizations to attract funds of the population for cultural, educational and other measures. Thus the Voronezhskaya Guberniya Ispolkom in 1922 organized a lottery for collecting money for a vocational and artistic education fund. Lotteries were held at about the same time for providing assistance to the population of the Volga area that was suffering from harvest failure.

The first All-Union Lottery was conducted by the Commission for the Improvement of Children's Conditions under the All-Russian Central Executive Committee in 1925 for a sum of 250,000 rubles. Winnings were paid in money and comprised about 8 percent of the obtained sum. Four such lotteries were subsequently organized: in 1926 for 500,000 rubles, in 1927 for 1,000,000 rubles, in 1929 for 1,500,000 rubles and in 1932 for 4,800,000 rubles. These lotteries were in kind. The worth of the winnings amounted to 8-15 percent of the obtained sum.

Beginning in 1926, lotteries underwent broad development and were organized by such different voluntary societies as Osoaviakhim, the Red Cross and Red Crescent Society, Avtodor [Society for Promotion of the Development of Automobile and Improvement of Roads], Osvod [Society for Promotion of the Development of Water Transport and Protection of People's Lives on Water Routes of the USSR], the Society of Friends of Radio, and others. From 1926 to 1940 Osoaviakhim conducted 14 lotteries in kind. The sums collected increased from year to year and in 1940 reached 200 million rubles versus 1 million rubles in 1926 (winnings amounted to 10-12 percent).

The conditions of lotteries changed, and their popularity grew. Thus in the second All-Union Lottery of Osoaviakhim in 1927, something like 3 million tickets, each costing 50 kopecks, were issued, the total amounting to 1.5 million rubles. There were 11,093 winnings amounting to 210,000 rubles; these included passes for travel abroad and in the USSR, bicycles, scientific handbooks on aviation and chemistry, sets of drawing instruments and slide rules, flying airplane models, carrier pigeons, year's subscriptions to the journal AVIATSIYA I KHIMIYA, and others.

In the fourteenth All-Union Lottery of Osoaviakhim in 1940, 70 million tickets, worth 200 million rubles, were issued; they included: 25 million tickets costing 1 ruble each, 25 million at 3 rubles each and 20 million at 5 rubles each. There were 410,500 winnings in kind valued at 25 million rubles. These included: passenger automobiles ZIS-101 and M-1, motorcycles, pianos, cameras, hunting rifles, bicycles, phonographs, radio receivers, watches, sewing machines, briefcases, fishing gear and passes for traveling in the USSR.

During the years of the Great Patriotic War, for the purpose of drawing the monetary funds of the population for defense of the country, the USSR People's Commissariat of Finance conducted four state money and in kind lotteries. In 1941, issued tickets amounted to 1.4 billion rubles, in 1942--2.1 billion rubles, in 1943--3.7 billion rubles and in 1944--5.7 billion rubles. For all these lotteries, winnings amounted to 20 percent of the sum of issued tickets. From 1.5 to 2.5 percent of all the tickets were winners. Tickets were issued at enterprises, institutions and kolkhozes through commissions for promotion of state credit and savings by means of cash payments and deferred payments. In the period from 1945 to 1956, lotteries in the USSR were not held.

In 1957, the Committee of Youth Organizations of the USSR held a monetary and in kind lottery called the All-Union Festival of Youth amounting to 600 million rubles with tickets costing 3 rubles. Komsomol organizations sold the tickets. Of the total number of issued tickets, winners amounted to somewhat more than one percent.

Since 1958, all union republics hold monetary and in kind lotteries, which are very popular among the population. Their conditions are basically the same and are determined by the councils of ministers. Lottery tickets cost 30 kopecks with the exception of the Ukraine where they cost 50 kopecks. Sixty percent of the sum of issued tickets go into winnings and in the Ukraine 65 percent. The obtained income goes into republic and local budgets and is allocated for the financing of economic and cultural construction. In 21 years, 4.6 billion rubles' worth of lottery tickets were sold. More than half of this sum went into the payment of prizes, while the rest, after deductions for organizational expenditures, went into budget receipts.

Tickets of monetary-valuable goods lotteries may be obtained at savings banks, parks, stadiums, theaters, motion-picture theaters, stores, communications institutions, newspaper stands, railroad trains, at stations and wharves. They are sold for cash to the workers of these organizations and are also issued by public distributors especially for this purpose on a strictly voluntary basis.

In cities and rayons, the sale of lottery tickets is organized by city and rayon finance departments, Gosbank SSSR institutions and central savings banks under the supervision of executive committees of city and rayon soviets of people's deputies. They have the obligation of providing tickets, propaganda and advertising materials to distributors and exercising control over the organization of sale, timeliness and correctness of obtained sums going into the budget.

The tickets of monetary-valuable goods lotteries are subdivided into issues, each of which has a separate drawing of winners. In accordance with editions, the tickets of each issue are printed in separate groups. Each group consists of an identical number of series, and a series contains an identical number of tickets. Such an arrangement makes it possible to conduct drawings of winners for a group and to raffle whole series of them. The numbers of series and tickets, which are winners, are considered to be winners in all groups of a lottery.

For the conducting of drawings, commissions are created that are made up of production pacemakers and representatives of soviet and public organizations, as well as of finance organs.

Prior to the start of a drawing, commission members place special tickets in plastic containers and then place them in four drums. The first receives tickets indicating the number and kinds of prizes in kind and also the number and amounts of monetary winnings, the second and third--numbers making up the numerals of winning series and the fourth--the numbers of the lottery tickets. Containers are taken out of the drums by children of preschool age. The procedure of conducting drawings excludes any possibilities of prior determination of what the winning tickets will be or of influencing this or that ticket to be a winner.

At the time of a drawing, commission members make a record of the winning series and ticket numbers; on this basis an official table is compiled, which is then published in republic newspapers. Savings banks start paying winners only after receiving the issue of the newspaper following the one in which the official table of winners was published. This is due to the necessity for careful verification of the published table.

Money prizes for lottery tickets, as well as money in place of prizes in kind up to 100 rubles inclusive are paid by all savings banks of a republic, bigger prizes are paid out only by central savings banks and first-class savings banks.

Winnings in kind with a value of up to 10 rubles can be received directly at a trading organization, larger ones can likewise be obtained there following a preliminary verification by a savings bank. Lottery tickets obtained in other union republics can be verified and prizes obtained for them at one of the central savings banks of a republic, kray or oblast center and also large cities.

Beginning in 1966, in addition to monetary-valuable goods lotteries held in union republics, DOSAAF SSSR lotteries have been conducted each year. The cost of a ticket is 50 kopecks; 50 percent of the sum of their issue is sequestered for winnings. The receipts are used for the construction of school buildings and sports structures, for the expansion of the material-technical base of DOSAAF organizations, the further development of defense mass work and military-technical types of sports, as well as for measures carried out by the educational organizations of the society. In the 13 years of sale of lottery tickets, receipts have amounted to roughly one billion rubles.

The lottery tickets are sold by DOSAAF organizations and their public distributors. The monetary sum from the issued lottery tickets is subdivided into two issues, each of which has an independent drawing. Monetary winnings and also money in place of winnings in kind are paid in the following amounts: by all central savings banks and also by savings banks first class--up to 500 rubles inclusive; by savings banks second class and agencies of savings banks --up to 100 rubles. To obtain a prize in kind regardless of its value and also money in place of winnings in kind valued in excess of 500 rubles, the tickets have to be sent to the Administration of the Central Committee of DOSAAF SSSR for Conducting Lotteries.

Since 1970, the Committee for Physical Culture and Sports under the USSR Council of Ministers has held a sports-number lottery "6 of 49" and since 1976 "5 of 36." The cost of a card for taking part in a "6 of 49" drawing is 30 kopecks. Since 1973, two "6 of 49" drawings are held. The cost of a card for taking part in them is 60 kopecks. For the "5 of 36" sports-number lottery, two drawings are made weekly, and a card costs 60 kopecks.

During 1970-1978, the cards sold for sports-number lotteries totaled a sum of one billion rubles. Receipts are used for the construction of sports structures, educational buildings, conducting of sports and sport-mass measures and for other purposes promoting the development of sports in our country. Thus the funds from Sports Lotto went into the financing of expenditures connected with the participation of the Soviet team in the Olympic Games of 1972 and 1976, preparation for Universiad-73, the holding of the 3rd Winter Spartakiada [Sports Festival of the Peoples of the USSR. Moreover, funds from this source went into the construction of the Medeo Mountain Skating Rink, the Krylatskoye Rowing Canal, Sokol'niki Sports Palace, and others.

Sports-Lotto cards are sold by public distributors of physical-culture organizations, voluntary sports societies and departments, personnel of sports stores, savings banks, communications and Soyuzpechat' enterprises and also by persons engaged in selling cards for social reasons. Sports-number lotteries are monetary. Fifty percent of the value of the sold cards goes into payment of winners; at each drawing, 50 percent of the cost of cards received for taking part in it is paid out in winnings. The winning fund of cards sold during the course of a year but not received by the Sports Lotto administration is raffled in one of the drawings of the following year.

Commissions are established for conducting drawings. They include personnel of the Main Administration of Sports Lotteries of the Committee for Physical Culture and Sports under the USSR Council of Ministers and also representatives of soviet, public and sports organizations. Drawings are held weekly on Saturdays and are transmitted on Central Television. The population is informed regarding their results on the radio and in the press.

Special equipment is used for the drawings; it consists of two automatic "pneumotrons" and also of two sets of drawing spheres with 1 out of 36 numbers in each for the 5 of 36 lottery and two sets of spheres with 1 out of 49 numbers in each for the 6 of 49 lottery. The numbers are shown on the external sides of the spheres, which are placed in the "pneumotrons" automatically with the help of a special cassette. For determination of the winning number, the spheres are also extracted automatically.

Payments start on the 11th day after the drawing and continue for the course of a calendar month. Prizes for 3, 4 and 4+1 of guessed numbers (types of sport) are paid according to tables of Sports Lotto administrations by savings banks in the zone of operation of a corresponding administrations on presentation of part A of a card. Winnings for 5 and 5+1 or 6 of the guessed numbers (types of sport) are registered by a Sports Lotto administration, the zone of operation of which includes a residential center in which parts B and C of a winning card were placed in a box upon personal presentation or by registered letter (with a description of the deposit) of part A. The administration writes out in the name of the owner of such a card a special instruction on a set form for obtaining the prize at a savings bank at the place of residence.

During 1978-1980, on the territory of the USSR, as well as in the GDR, Hungary, Bulgaria, Poland and Czechoslovakia, there will be 8 issues of the International Olympics Sports Lotto. For each of them, a drawing is to be held in the following order:

19 July 1978, Moscow, USSR  
15 November 1978, Prague, CSSR  
14 February 1979, Budapest, Hungary  
16 May 1979, Sofia, Bulgaria  
15 August 1979, Prague, CSSR,  
14 November 1979, Warsaw, Poland  
20 February 1980, Berlin, GDR  
21 May 1980, Moscow, USSR

Receipts from the International Olympics Sports Lotto on the territory of the USSR are sent in the amount of 75 percent for the financing of capital investments and measures connected with the holding of the Olympic Games in 1980 and 25 percent to the USSR Sports Committee for the Training of Soviet Sportsmen. The International Olympics Sports Lotto is conducted on the basis of the "6 of 49" sports-number lottery. The cost of a ticket is 60 kopecks. Fifty percent of the cost of the sold tickets goes into the payment of

winnings. Winnings range from 3 rubles to 10,000 rubles and also include tourist trip passes to Olympiad-80 (one trip pass for each 100,000 issued tickets). Each drawing consists of two draws -monetary winnings and tourist trip passes.

Drawings of monetary winnings are carried out sequentially in the television studios of the capitals of the countries participating in the lottery at a special hour-long sports entertainment program and are transmitted by means of the Intervideniya System. The tourist trip passes are drawn separately in each country participating in the International Olympics Sports Lotto.

Registration and issue of monetary winnings are done according to the procedure and times established for the "6 of 49" lottery. The owner of a ticket winning a tourist trip pass is given a certificate by the administration of Sports Lotto giving him the right to receive it. The time and periods for issue of tourist trip passes to Olympiad-80 will be announced by the Main Administration of Sports Lotto on television, radio and in the press. A total of 2,000 such trip passes will be issued.

Since the end of 1976, our country has conducted the Olympics Monetary and in Kind Sprint Lottery, which immediately gained great popularity. It is attractive because each participant learns immediately whether he has won or not. At the present time, two forms of this lottery exist; one with 50-kopeck tickets and a maximum monetary win of 5,000 rubles and the other with 1-ruble tickets and a maximum monetary win of 10,000 rubles.

In addition to monetary winnings in Sprint in 1978-1980, there will also be raffled 825 Volga automobiles, 7,425 Zhiguli, Moskvich and Zaporozhets automobiles, 7,425 motorcycles and so on. A book lottery has been in operation since 1965. There is held each year an International Lottery of Solidarity of Journalists and once each two years the All-Union Art Lottery.

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## WHOLESALE-PRICE REVISION

Moscow SUTSIALISTICHESKAYA INDUSTRIYA in Russian 26 Aug 79 p 2

[Article by A. Duginov, economist, Moscow: "Revision of Wholesale Prices"]

[Text] The question of wholesale prices immediately comes up in major changes of the economic mechanism. Such was the case during the period of the economic reform--the mass conversion of enterprises to the new conditions of work only began after the price revision in 1967. The present measures, which are aimed at improving efficiency of production, also call for the development of new wholesale prices, measuring more reliably outlays of social labor for manufacture of products. This is understandable--in the final analysis, all indicators of efficiency of production reflect the true state of affairs only to the extent that prices of products are accurate.

Such accuracy so far does not exist. In fact in the prior reform of wholesale prices, average sectorial production cost as it existed in 1965 served as the basis for them. Subsequently, prices changed for individual goods (for machinery, rolled products, coking coals and so forth), but their general level diverged increasingly from true product cost.

Using raw-material sectors as an example, after 1967 tremendous changes occurred in distribution of production. New natural resources in Siberia and the Far North were brought into the operational turnover. Naturally, raw-material costs became higher. Outlays on the development of science and technology, protection of the environment and improvement of production quality increased significantly. Wages increased. Each new work place costs more--more comfortable working conditions do not come free. Expenditures have also increased for the extraction of resources in earlier developed regions. Amortization deduction norms have been increased, and this is also a significant component of a wholesale price. Of course, reverse factors have likewise been in operation--technical progress, growth of labor productivity. But they did not have the power to completely stop the increasing cost of products. Naturally, the profitability of a number of raw-material sectors has dropped below permissible level, while coal extraction, logging and production of thermal energy are done at a loss.

For consumers, low wholesale prices create the impression of low cost of raw materials, which naturally does not serve as an incentive for economic utilization of resources, their greater processing, complex use of natural resources, reduction of losses and waste. On the other hand, in some sectors excessively high profitability is to be found. This likewise reduces the interest of manufacturers in reducing production cost.

As we see, the wholesale prices and rates existing in industry have largely become obsolete, and the fulfillment of the decree of the CPSU Central Committee and the USSR Council of Ministers on improvement of the economic mechanism requires the development of new ones.

Production cost is the basis of price. Understandably, we do not have in mind production cost as it is to be found at some enterprises--there must be included without fail progressive norms for the utilization of raw and other materials, equipment, rational labor organization. At the same time, production costs are understood here in a broader sense than were discussed earlier. Up to now outlays of the state on geological prospecting operations, restoration of felled timber and on social insurance of workers and employees did not completely relate to a plant's production cost. Now they will be included in the price.

At the same time, production cost is not the sole basis of price. In the processing sectors and especially in machine building, the dominant principle will be reduction of price per unit of useful effect. This has to be explained. Let us say that an enterprise in place of one machine tool begins to put out another that is twice as productive. Regardless of the cost of the new item, its price compared to the replaced model could be likewise above the maximum by a factor of two, otherwise it would not be advantageous to purchase. Not only productivity but also other parameters of useful effect--convenience of the new item, service life, cost of maintenance and the like--can be measured.

Until recently it frequently happened that the price increased more quickly than the useful effect, which resulted in unjustified increases in prices of machines. Product manufacturers explained this by saying that otherwise the new item would be unprofitable. But if the cost increases more than the useful effect, then the new item should not be made as a rule, as it is unprofitable. It is now planned to increase the role of the so-called limit price--it is already necessary to indicate in the design assignment what should be the upper limit of the cost of the new product.

Useful effect signifies an upper price limit. In practice, the wholesale price should be below this limit in order to interest the customer in purchasing the new item.

Here we approached the next principle of price revision: it is necessary to stimulate the production of highly efficient products. As we know, the wholesale price represents production cost plus a profit. More progressive machinery equipment and materials are expected to become more profitable, that is, the share of profit in their price will be relatively higher. Then they

become more preferable for manufacturers. These aims will be served by incentive markups for new, highly efficient products, which correspond to the best domestic and foreign models. If the product receives the Seal of Quality and its production is based on inventions and discoveries, then the markup is increased by a factor of one and a half, but in all cases only within the limits of the economic effect.

On the other hand, for obsolete products that should be taken off production, lower profitability will be established, as well as price reductions. The sum of markups and markdowns is not taken into account in an enterprise's plan. What does this result in? When an enterprise produces more advanced products, it finds it easier to attain assigned cost indicators, because each item provides more sizable receipts and profit than specified in the plan. The manufacturer begins to get less for obsolete products than the plan prescribes; although they are sold to customers at the full price, the price reduction is included in the budget and does not go to the credit of the manufacturer.

Economy of raw materials is encouraged in every possible way. Should the manufacturer start to use cheaper materials without reducing the quality of a product, the wholesale price would remain unchanged to the end of the five-year plan. It therefore follows that profits grow with reduction of production cost. Wholesale prices for new products with smaller material intensiveness are set with the intention that profit would be no less than in the sale of the replaced product. All this is stipulated in the decree of the CPSU Central Committee and the USSR Council of Ministers on improvement of the economic mechanism.

For some products prices are reduced for others they are increased. In the chemical industry, for example, synthetic resins, plastic materials, rubber, their processed products, synthetic fibers, reagents and other highly profitable types of products are becoming cheaper. Concentrated and complex fertilizers, effective plant-protection agents and new plastics will be somewhat more expensive.

In the coal industry, prices compensate for growing outlays in fuel extraction. Coal quality will be given greater consideration than before. Territorial differences will be provided for to stimulate the production and use of cheap coal from Kansko-Achinsk and Ekibastuz deposits; prices for them will be below the average level.

Petroleum and gas will be more expensive. This is to be explained by the growth of expenditures for their extraction. But not only that. Once coal becomes more expensive, then prices will have to be raised for other kinds of fuel, even regardless of their production cost--otherwise there will be an unjustified demand for liquid and gaseous fuel to the detriment of solid fuel. Identical prices will be established for petroleum depending on its quality for all petroleum refining plants. Wholesale prices for petroleum products are being revised--aside from everything else, this will stimulate more thorough refining of petroleum. Rates will increase for electric and thermal power while retaining present rates for electricity consumed by the

population, trade and public-dining enterprises and all agricultural enterprises. For the sake of avoiding false rumors, it should be said as definitely as possible that the new wholesale prices and rates will be adopted while retaining existing retail prices.

In ferrous metallurgy, the output of economic production is encouraged. In nonferrous metallurgy, the new prices will serve as an incentive to more complete extraction of useful components from the raw material. In the timber sector, payment according to the number of trees cut down will increase to a level that is sufficient for the full reimbursement of the state for its forestry operations. Again the new prices will make it profitable for more rational use of timber.

In the light industry, price revision is bound to stimulate conservation of raw materials, assortment expansion and renewal, satisfaction of consumer demand, improvement of product quality and production of products for children.

In machine building and other sectors of the processing industry, as has already been said, the dominant policy will be reduction of wholesale prices per unit of useful effect, which is the practical equivalent of direct price reduction of products.

In price revision, it is very important to correctly establish a profitability norm. Calculations show that it is necessary to get 12-15 kopecks of profit per ruble of producer goods. This norm will not be, however, identical—the USSR State Committee for Prices in agreement with Gosplan and the Ministry of Finance of the Union will differentiate according to subsectors and, in some cases, even by subsectors.

If profit be compared with production cost, in 1977 it constituted 11.8 percent of the wholesale price of enterprises and 14.4 percent in heavy industry. Incidentally, this gage largely loses its significance: broader use will be made of establishment of profit not on the basis of the entire production cost but only with reference to outlays of living labor.

The work ahead is of a major and responsible nature. All ministries and departments are under the obligation in the preparation of new prices to take into account assignments relating to lowering of production cost, growth of labor productivity, wide-scale use of achievements of science and technology, improvement of production and management, better use of raw materials and fixed capital. It will be necessary to revise obsolete norms of material and labor outlays so that nonproductive expenditures and losses do not find their way into production cost.

## IMPROVING ECONOMIC PLANNING, MANAGEMENT, EFFICIENCY

Moscow EKONOMICHESKAYA GAZETA in Russian No 33, Aug 79 pp 3-4

### Article: "Improving the Economic Mechanism"

Text The Communist Party, in exercising leadership in the development of Soviet society, is devoting primary attention to comprehensive reinforcement of the economy, to increasing its efficiency, and to improving the management of economic construction. "The stage of mature socialism and the scientific and technical revolution," L. I. Brezhnev points out, "are placing higher and higher demands on the mechanism of economic management, presuppose its further improvement, and require substantial and purposeful organizational work."

Under conditions of developed socialism our country has achieved great progress in economic and social development and in improving the people's welfare. During the years of the Eighth, Ninth and 10th Five-Year Plans, dynamic growth has been achieved in the economy and the production and scientific and technical potential has become even more powerful. The national income was more than doubled during this period. The real per capita income of the people increased by a factor of 1.8.

These achievements convincingly demonstrate the advantages of the socialist planned system of economy. They are the result of the party's scientifically sound economic policy which was developed and consistently carried out since the October (1964) Plenum of the CPSU Central Committee. Putting it into effect required systematic reorganization of the practice of management, planning and economic stimulation of production which had taken shape previously.

In the current stage of the country's economic development, at a time when the scope of the economy has increased significantly and economic relationships have become more complex, and when increasing production efficiency on the basis of stepped-up introduction of scientific and technical achievements has assumed decisive importance, further improvement in the management of the national economy is becoming more and more urgent.

The fundamental ways of improving the economic mechanism were defined by the party's 25th Congress and by subsequent CPSU Central Committee Plenums. The CPSU Central Committee decree on further improving the economic mechanism and on the tasks of party and state organs and the CPSU Central Committee and USSR Council of Ministers decree "On improving planning and reinforcing the influence of the economic mechanism on increasing production efficiency and work quality," which were adopted recently, are a major step in putting them into effect.

A key characteristic of these party documents is that, being guided by the rich experience of socialist planning and by economic experiments and the recommendations of science, they are an important link in the complex of measures to further improve planning and management and the entire system of economic operation.

The economic mechanism is being aimed even more at increasing the efficiency of production and work quality, at achieving high national economic end results, and at more completely satisfying growing public and individual demands. The task of ensuring efficient use of everything which the national economy has at its disposal, of relying mainly on intensive factors of growth, and of more widely introducing in production scientific and technical achievements and advanced experience is at the center of management and planning activity.

The decisions which were adopted have been aimed at consolidation and development of the principles of democratic centralism--centralized planning leadership of the economy and democratic principles in the management of production, and creative initiative by labor collectives.

#### /Improving the level of planning work/ *[in boldface]*

Of the most importance in improving the economic mechanism is improvement in planning, enhancing the role of the state plan as the main instrument to carry out the party's economic policy. A number of measures to improve the level of planning work in all sections of the economy have been specified.

The organic link of the plan with the achievements of science and technology and advanced experience and its orientation toward solution of social problems is being reinforced. An even greater concentration of forces and resources is being stipulated for fulfillment of statewide programs, and the system of planning indicators is being improved so that they provide every possible incentive to labor collectives in the struggle for an increase in labor productivity, for maximum use of fixed capital, and for economy of material resources. Solution of long-term and current problems, as well as the problems of sectorial and territorial development, is being more closely coordinated.

The integrated nature 'kompleksnost'<sup>7</sup> and continuity of planning are being ensured on the basis of socioeconomic tasks determined by the party. The system of intercoordinated long-term, five-year and annual plans has been clearly defined. This system embraces an overall program of scientific and technical progress for 20 years (by 5-year periods), the basic trends of the country's social and economic development for 10 years, five-year plans and annual plans. Periods of time have been established for drafting plans which have been balanced in accordance with all indicators and for bringing them to production associations, enterprises and economic organizations.

Special-purpose overall scientific and technical, economic and social programs, as well as programs for development of individual regions and territorial-production complexes, are becoming the most important component part of state long-term plans.

The five-year plans for economic and social development, with allocation of targets by years, are the main form of planning. Annual plans specify the targets of the five-year plan for the appropriate year. With the aim of achieving greater validity for five-year plans, the balances of material and labor resources, production capacities, the financial balance and balance of personal monetary income and expenditures will become established as a part of them and reserves of material and financial resources will be determined.

The importance of the normative method of planning is being reinforced. Five-year plans will contain constant economic norms differentiated by years. These include norms for the wage fund per ruble of output, funds for economic incentive and apportionment of profit, and other planning norms.

It is fundamentally important that fulfillment of the five-year plan at all levels of economic management is evaluated as a total increasing from the beginning of the five-year plan and that fulfillment of the annual plan is evaluated as a total increasing from the beginning of the year.

The role in drafting plans of labor collectives which most completely take into account internal production reserves is increasing. Associations and enterprises put together drafts of five-year plans (with allocation of targets by years), guided by the control figures of ministries and departments. Formation of the annual plans begins from below--with associations, enterprises and organizations. Based on development of socialist competition and utilization of internal economic reserves, associations and enterprises put together counterplans which exceed the targets of the five-year plan established for the appropriate year. Their labor collectives receive the opportunity to independently determine a broad range of indicators in the annual plans (within the limits of the approved five-year plan).

Counterplans adopted at the initiative of production collectives and coordinated with material resources are included as part of the annual plan. At the same time, the higher the level of plan targets which a collective undertakes, the greater the opportunities for incentive to the workers. This creates material incentive for them in adopting and fulfilling stepped-up plans. By this means, counterplans are included organically in the system of state planning, and discussion and adoption of them becomes the most important form of participation by the masses in the management of production.

To ensure coordinated and efficient operation of the economic mechanism, ministries and departments must bring plans in accordance with all basic indicators (including material and technical resources) to associations and enterprises in the periods of time established. They also must ensure the stability of the plans and economic norms approved for associations and enterprises without permitting their unjustified adjustment.

In order to reinforce the social trend of plans, elaboration of general divisions for the entire complex of measures in the field of social development has been specified for inclusion in them at all economic levels. Measures for improving work conditions, qualifications and occupational skill, educational level, cultural and general conditions, medical service and other measures in the field of social development are reflected in them. It is important to make extensive use of the positive experience of Moscow, Leningrad, Krasnoyarskiy Kray, and Tyumenskaya, Ivanovskaya and other oblasts in the preparation of complex plans for economic and social development.

The rights of republics and local soviets of people's deputies in planning have been expanded. With the objective of overall economic and social development in union republics, the indicators of the plans of production associations, enterprises and organizations of union subordination located in the territory of a given republic will be included in their five-year and annual plans. Soviets of people's deputies will draw up balances of manpower resources, develop summary five-year and annual plans for the production of local construction materials, consumer goods output, and plans for housing and public utilities and cultural and general construction and supervise their fulfillment.

The system of planning indicators is being substantially changed so that they are oriented toward efficiency and quality to a greater extent. With the aim of more objective evaluation of the activity of each labor collective, the indicator of standardized net production, the use of which has been stipulated for the majority of industries as basic in planning production and determining labor productivity and the planned wage fund, is being introduced. This indicator has been approved at enterprises of the Ministry of Heavy and Transport Machine Building, the Ministry of Power and Machine Building, the Ministry of the Shipbuilding Industry, the Ministry of Machine Building for Light and Food Industry and Household Appliances, the Ministry of Chemical and Petroleum Machine

Building, and the Ministry of Machine Building for Animal Husbandry and Fodder Production. The transition to the indicator of standardized net production will be carried out to the extent that the appropriate industries have prepared for its introduction.

Achievement of national economic end results and satisfaction of public demands through efficient use of all resources becomes of primary importance in developing plans and evaluating their fulfillment. This becomes apparent, in particular, in the expansion of opportunities for consumers to influence the formation of production plans. Thus, in the process of preparing plan drafts, associations and enterprises determine the products list and conclude economic contracts for a five-year period on the basis of long-term economic links with consumers and suppliers. Fulfillment of the plan for deliveries of output to consumers in conformity with the contracts made is becoming the most important factor in evaluating the results of the work of collectives and in the formation of material incentive funds.

Completion basically in 1980 of the transition of associations and enterprises to direct long-term economic ties, as well as expansion of the practice of guaranteed overall supply based on contracts with supply organizations, is being envisaged for the best material and technical supply of production.

A number of new indicators also are being introduced for other sections of the plan. Thus, a limit now will be specified on state capital investments for a five-year period which are not subject to reconfirmation in annual plans. It defines the maximum amount of capital investments for the planned introduction of capacities and projects and the formation of standardized stockpiles [obrazovaniye normativnykh zadelov].

The system of natural measuring devices [natural'nyye izmeriteli] in metallurgy, machine building and other industries is being improved, based on the use of scientifically sound technical and economic indicators which make it possible to take efficiency, quality and other consumption aspects of output into account. Production of equipment is to be planned in accordance with an expanded products list, and indicators in tons will be applied in necessary cases as accounting indicators.

Establishment in the five-year plans of associations and enterprises of limits on the number of workers and employees and targets for reduction of the proportion of manual labor have been specified. Use of it has been called upon to promote overall mechanization and automation of production and the release of workers engaged in manual labor and their transfer to sectors requiring higher skills. Significant experience in reducing manual labor has been accumulated at many leading enterprises. The initiative of labor collectives of Zaporozhskaya Oblast, where a harmonious system of organizational-technical and economic measures for the overall mechanization of labor at enterprises and in organizations of different sectors of the national economy was worked out, has been approved by the CPSU Central Committee.

Plan targets for average reduction of the norms for expenditure of the most important types of material resources are acquiring substantial importance. Introduction of this indicator is reinforcing the orientation of production collectives toward reducing the materials consumption of items as one of the most important criteria for production efficiency.

Improving the validity of plan targets on the basis of economic and engineering calculations was stipulated by the decree. The passports for every association and enterprise which are to be made up in 1979-1980 will serve as a good basis for this. These passports will contain data on the availability and utilization of production capacities, including the shift coefficient, and on the organizational and technical level and specialization of production, as well as technical and economic indicators necessary for drawing up stepped-up five-year and annual plans.

#### Technical progress and quality/ [in boldface]

The new decisions of the CPSU Central Committee and the USSR Council of Ministers call for a broad system of measures to accelerate technical progress and improve the quality of output. An overall program for scientific and technical progress has been aimed at this first of all. The range of obligatory indicators for the technical improvement of production and for the economic gains being received from carrying out scientific and technical measures has been broadened in the plans of ministries, departments, associations and enterprises.

The most efficient solution of the most important scientific and technical problems and problems of the overall utilization of natural resources in the current stage requires improvement in the development of special-purpose programs directed at this. Such programs have been called upon to take into account fulfillment of scientific research efforts and to provide for final objectives and technical and economic results, time periods and stages for carrying out operations--from scientific research to practical realization. It is important that the principal ministries and departments responsible for carrying out programs as a whole and their individual targets are determined at the same time.

An evaluation of the technical level of machines, equipment and other machinery intended for production purposes which are being turned out has been stipulated for 1979-1980 with the aim of developing and implementing measures to improve technical and economic indicators of products which are being manufactured and newly assimilated and removing obsolete output from production. In the future such an evaluation will be made systematically.

In ensuring the high quality of machinery and consumer goods, the role of state standards is increasing. In this connection, a review of obsolete standards has been called for. New standards, taking into account all technical innovations, should ensure improvement in production quality.

reduction of the weight of products, a decrease in fuel and power expenditure in the process of their utilization, and standardization of components and assemblies uzly. In the near future, development of overall programs of standardization for the most important types of consumer goods which provide for improvement in the quality standards for these goods will be completed. It is also being planned to draw up a program of operations for standardization and specialization in the production of items for general machine building use.

Other key measures to improve the technical level of production, the quality of output and expansion of its variety also have been determined. The indicator of the proportion of output of the highest category of quality is becoming more significant, which presupposes periodic certification of output. Targets are being established in plans to increase the output of the highest category of production and remove the obsolete category. At the same time, the proportion of production of the highest quality category appears as an important factor in evaluating the results of economic activity.

A number of measures to expand the system of a wholesale price surcharge for highly efficient technology and output with the Emblem of quality, as well as discounts from the wholesale price for output of the second quality category, which has proven itself in practice, have been planned. In particular, the maximum amount of a bonus surcharge to the wholesale price for new, highly efficient output of the highest quality category which is intended for production and technical purposes is being increased. In the increased amounts, deductions will be made for the economic incentive funds for consumer goods output with the Emblem of Quality.

Acceleration of scientific and technical progress is determined in many respects by the activity of scientific institutions and by the system of planning and economic incentive for their work. In this connection, applying the experience of the Ministry of Electrical Equipment Industry is being called for everywhere. A single fund for the development of science and technology is being set up in ministries and departments. Its capital has been earmarked for financing scientific research, experimental design and industrial operations and compensation for expenditures connected with the development and incorporation of new forms of output and technical processes, and with increased expenditures during the first years of production of the new output.

Before the end of the present five-year plan, we have to complete the changeover of scientific research, planning and design and manufacturing organizations, experimental enterprises, and scientific production and production associations to a cost accounting system of operations organization to create and introduce new technology on the basis of orders and job authorizations Zakazy-naryady (contracts). The goal of this system is to accelerate development of new forms of output of preset parameters and to ensure its rapid assimilation and output. It

presupposes that before the appropriate research and design operations are begun, their end results (including national economic gains), those who perform the work and the terms for completing the work in all stages, as well as the necessary material resources and the amounts and sources of financing and material incentive are determined.

It has been planned to shift scientific research, planning and design, and industrial organizations gradually to the system of accounting for fully completed work accepted by a customer instead of payment for work in stages. Material incentive funds and funds for social and cultural measures and housing construction, as well as development funds, will be formed in these organizations.

#### /Improvement of construction work/ [in boldface]

The decisions adopted contain a number of interrelated measures for further improving the economic mechanism in construction. These measures have been aimed at improving the effectiveness of capital investments and accelerating the commissioning of production capacities and projects.

A basic factor in improving construction work is the shift to stable five-year plans of capital construction (with allocation of targets by years) and the reinforcement of their equilibrium [sbalansirovannost'] with the material, labor and financial resources and capacities of construction and installation organizations. Earmarking of capital investments for ministries and departments under a planned increase in output has been stipulated. Production in operation and new construction now will be planned as a single whole, with allowance made for opportunities to increase production output with existing production capacities. Allocation of funds for renovation and retooling of operating enterprises has been specified as a priority matter. Such a procedure in developing plans for capital investments has been aimed at ensuring that construction of new enterprises is begun only if the needs of the national economy for specific forms of output cannot be provided by operating enterprises, with allowance made for their renovation and retooling.

A system of planning indicators has been established for construction ministries and construction and installation organizations which orients them toward end results--the commissioning of production capacities and projects. Among these, the indicator of volume of commodity construction output [tovarnaya stroitel'naya produktsiya]--the value of construction and installation operations carried out at complexes and projects under construction which have been completely prepared for turning out production and rendering services and which have been turned over to a customer--is becoming the most important. This indicator, together with targets for commissioning capacities and projects, increase in labor productivity and profit, will serve to evaluate the results of the activity of construction organizations and in the formation of economic incentive funds.

Commodity construction output gradually will be placed at the foundation of cost accounting relationships. An important stage will be the completion in 1981 of the changeover to accounting between customers and contractors for fully constructed enterprises and projects which have been put into operation in accordance with the estimated value of commodity construction output. With the changeover to the new accounting procedure, partial payment by customers to contracting organizations for expenditures on incomplete construction and installation work is discontinued. Payment for these expenses up until projects are turned over for operation will be made through bank credits. In the event that planned periods for construction are exceeded, higher interest for the use of the loan has been stipulated.

All this significantly enhances the role of economic levers in the planning and organization of construction output and in relations among buyers and contractors and planning and design organizations. The experience accumulated in the construction organizations of Belorussia and Lithuania and by the construction workers of Orel [orlovskiye stroiteli] was taken into consideration in elaborating these measures.

The decree also covers a number of other important matters in the organization of construction work. It calls for improvement in the procedure for drafting and approval of projects and estimates, in the procurement of equipment for construction projects, in the financing and extension of credit to construction organizations, and in the payment of wages and bonuses to construction workers. The changeover of construction projects to full supply of materials through territorial organs of material and technical supply in accordance with orders and in conformity with approved planning estimates will be completed in the first year of the new five-year plan.

Drafting and implementation of measures to improve the management of capital construction have been planned in order to change over to a two or three element system of management [dvukh-trekhzvennaya sistema upravleniya] in the 1979-1981 period. As a result of this, construction and installation production associations will become a fundamental cost accounting link in construction.

#### /The development of cost accounting/ [in boldface]

The organic unity of planning with the use of economic levers and incentives is provided in the new methods of management. Targets of the five-year plan and long-term economic norms are becoming the foundation for the further development of cost accounting in associations and enterprises. The amount of resources being placed at the disposal of economic organizations has been made directly dependent on improvement of the end results of their production activity.

Reinforcement of cost accounting relationships has been closely linked with further development of the initiative of labor collectives and the

expansion of the rights of associations and enterprises. Formation of economic incentive funds will be carried out in accordance with fixed norms, approved in differentiated amounts by years of the five-year plan. At the same time, associations and enterprises which have achieved a significant increase in the output of new, highly efficient products intended for production and technical purposes and new high-grade consumer goods receive the right to increased norms for the formation of funds. The assets of these funds must be used only for a special purpose; surpluses in them are carried over to the next year and are not subject to withdrawal.

Fulfillment of the plan for deliveries of output in accordance with contracts, an increase in labor productivity, and improvement in the quality of output and increase in profit are becoming the basic fund-forming indicators. In addition, other fund-forming indicators--savings in material resources, improvement of the capital-output ratio and the shift coefficient, reduction of the production cost of output turned out, the level of profitability, and the increase in production of output in physical terms also may be used, taking the characteristics of industries into consideration.

It has been established that the fund for social and cultural measures and housing construction will be formed on the scale of 30-50 percent of the material incentive fund. Ministries and departments have been granted the right to differentiate deductions within these limits, depending on the housing provided and the availability of social and cultural institutions. It is important to emphasize that management and trade union committees of associations and enterprises, with the participation of labor collectives, have been given the opportunity not only to determine the orientation for spending the capital in this fund, but also to use for housing construction and social and cultural measures part of the assets of the material incentive fund.

Norms for deductions from profit and amortization allowances have been made the basis for formation of the fund for production development. The role of this fund in implementing measures for mechanization and automation, replacement and modernization of equipment, and improvement in the organization of production and labor, as well as in implementing other measures for retooling production, is increasing significantly. These measures, worked out by associations and enterprises themselves, are included in the plan for capital construction for the full amount of expenditures and are being provided in order of first priority with the material resources and capacities of construction and contracting organizations.

In order to increase responsibility of all economic units for the results of work and incentive for the best use of resources--from the enterprise to the ministry--a new principle for the apportionment of profit is being introduced with the 11th Five-Year Plan. It has been planned to establish for industrial ministries (to the extent of their readiness), on the basis of targets approved in the five-year plan, a norm differentiated by years

of the deductions from profit which are at their disposal for the development of the industry. Bank credit will be more widely used for these same objectives. Such experience has been accumulated for a number of years by the Ministry of Instrument Making, Automation Equipment, and Control Systems.

Effective measures have been planned to improve the incentive of labor collectives to step up the increase in labor productivity and reduce personnel turnover. Introduction of long-term norms for wages per ruble of output will reinforce the dependence of wages on increased labor productivity and improvement in the end results of the work of enterprises and economic organizations.

Associations and enterprises have been granted the right, through savings in the wage fund compared with the established norm, to pay bonuses on wage rates for workers holding two jobs and for fulfillment of the established amount of work with less workers. The procedure for providing material incentive for workers and engineering and technical personnel and employees for high indicators in work is being improved. Thus, workers are paid bonuses on a scale of up to 50 percent of the rate (wage rate) for holding two jobs and for fulfillment of the established amount of work with less workers; engineering and technical personnel, primarily foremen, as well as employees for high skill, are paid bonuses on a scale of up to 30 percent; and designers and process engineers are paid bonuses on a scale of up to 50 percent of the wage rate (within the limits of up to 1 percent of the wage fund of the association or enterprise).

Incentive is being reinforced for workers who have demonstrated initiative in introducing technically sound norms and reviewing them on schedule. They will receive a one-time lump award for savings as a result of a review of these norms.

The many years of experience of the Volga Motor Vehicle Plant, the Kirov plant, the Baku Domestic Air Conditioner Plant and a number of other leading enterprises have demonstrated the advantages of the brigade form of labor organization. Now it should become basic in industry and construction.

Collectives (councils) of production brigades have been granted the right to determine, within the limits of norms and the funds established for them, the amounts of bonuses and earnings paid for the results of the work performed by the entire collective of the brigade, taking into account the real contribution of each one in the overall work results. They can recommend establishment of bonuses and supplementary payments for brigade members for occupational skill and for holding two jobs, and can recommend that management and the trade union organization change the category of a worker, in the established procedure, taking the quality of his work into account. The brigade has been granted the right to determine winners of socialist competition within the brigade and the amounts of their incentive, and to put forth candidates for material and moral incentive in accordance with results of intraplant socialist competition.

Persistently introduce new methods of management/ *[in boldface]*

The party is considering implementation of the measures mentioned to improve the economic mechanism as an important economic and political undertaking. This requires extensive organizational work and daily attention from party, soviet, economic, trade union and komsomol organizations and the mass information media.

It is very important to widely interpret the nature of the new methods of management by persuasively demonstrating that improvement in management and planning and increasing the efficiency of production and work quality are indispensable conditions to further increase the material welfare of the Soviet people and achieve progress in communist construction.

Practical implementation of the measures cited to improve the economic mechanism requires that ministries and departments develop and bring to associations, enterprises and construction organizations the appropriate standardized documents expeditiously and render them specific assistance in assimilating and introducing the new methods of management. All organs of economic management have been called upon to aim for more efficiency and businesslike operation in making decisions, to steadily reinforce state and labor discipline, and to increase the responsibility of all workers for the fulfillment of plans and contract obligations. The conduct of this work must be combined with broad utilization of advanced production experience.

Thorough study of the experience of ministries, leading associations and enterprises and construction organizations, as well as scientific research and planning and design organizations, which have conducted economic experiments in past years in the use of new indicators, in improving planning and management, and in further reinforcing cost accounting is acquiring great significance. Everything necessary must be done so that supervisory personnel master the new methods of management more rapidly and to the full extent.

The measures developed to improve planning and reinforce the influence of the economic mechanism to increase production efficiency and work quality are becoming widely known in industry and construction. Next in turn is improvement in planning and incentive in transportation and the services field. With the aim of radically improving the organization of shipments of national economic freight and passengers, it has been planned to develop proposals by the end of this year to increase the influence of the economic mechanism on the end results of the activity of different types of transport enterprises and organizations and to increase their material responsibility for nonfulfillment of plans for shipments that were agreed upon.

The preparation and practical implementation of measures to improve the economic mechanism must contribute to improvement in the level of work of all sections of the economy from the very first steps. It is important

that labor collectives even now concentrate attention on more efficient use of production capacities and resources, on increasing labor productivity and improving product quality, and ensure successful fulfillment of planned targets of the 10th Five-Year Plan.

Planning and economic organs now are drawing up drafts of plans for 1980--the concluding year of the 10th Five-Year Plan--and are preparing planning for the next, 11th Five-Year Plan and for the future up to 1990. We must place work to uncover reserves for improving efficiency and quality on a broad footing everywhere and incorporate them in the drafts of plans.

Socialist competition serves as a powerful lever in accomplishing this task. In greeting participants in the All-Union Scientific and Practical Conference held in Leningrad in April this year, L. I. Brezhnev noted: "Now this patriotic movement has acquired new features, and has become really national. The struggle for full realization of the opportunities for developed socialism, acceleration of scientific and technical progress, and the steady development of production efficiency and work quality are the center of attention for those who are competing."

Under modern conditions socialist competition must be closely connected with the new methods of management. Party, economic and trade union organizations locally have been called upon to constantly improve the organization of competition, to ensure its orientation toward the development and successful realization of counterplans for 1980 and the achievement of high end results. At the same time, it is necessary to fully make use of the conditions created by the new decisions for the development of initiative in labor collectives.

Practical realization of the broad complex of measures to improve the economic mechanism will ensure a powerful new upsurge in the Soviet economy and further improvement in the national welfare.

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## FINANCING THE OPERATION OF EXPERIMENTAL PLANTS

Moscow FINANSY SSSR in Russian No 7, Jul 79 pp 22-26

[Article by M.L. Bashin: "Financing the Work of Experimental Production Installations and Experimental Facilities"]

[Text] With each year the national economy has an increasing number of new-technology facilities developed by ministries. We know that new types of machines, machine tools, equipment and more progressive technological processes, before going to series plants, go through the stage of development and attainment of assigned technical-economic parameters at experimental production installations and experimental facilities.

This has brought to the fore a complex of financial problems relating to the difficult and lengthy process connected with the development and putting into operation objects of new technology at experimental production facilities. In our opinion, reserve capabilities exist in this sphere of the national economy, and their use will make it possible to increase the effectiveness of financial resources used in the development of scientific and technical progress.

Financial outlays on the design and development of new equipment (without taking capital investments into account) consist of two basic parts: the cost of experimental and finishing work and organization of the process of introduction of objects of new equipment at series plants. The first part provides for the work of experimental production installations. These outlays result in the creation of experimental models of planned items and complete sets of technical documentation on the basis of which series enterprises organize their industrial output.

The process of creation of experimental models is connected as a rule with increased expenditure of all types of resources, first of all financial. K. Marx explained increased financial, labor and material expenditures in the development and adoption of new machinery by the fact that there exists "a big difference between expenditures for the initial construction of a new machine and the expenditures of its subsequent production."<sup>1</sup> This

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1. Marx, K. and Engels, F. "Sochineniya" [Works]. 2nd ed., Vol 25, Part 1, p 116.

determination characterizes the economic mechanism of creation of new equipment and discloses in particular the specific aspect of price formation of experimental models, embodying the labor of scientists, designers, technologists and workers employed in experimental production facilities.

For the purpose of providing a single methodological approach to the determination of prices of experimental models, the USSR State Committee for Prices has established instructions on the manner of setting wholesale prices for experimental models (batches) of new types of productions of a production-technical nature.<sup>1</sup> The introduction of these instructions was meant to stimulate sectorial scientific-research institutes, design bureaus and experimental production installations to reduce the time of preparation and introduction of series production of new products and to spend financial resources more effectively.

The wholesale prices of experimental models and of objects of new equipment equated with them are set on the basis of the planned calculations of the production cost of experimental work, reflecting all types of expenditures for the creation of an experimental model (batch) and profitability computed on the basis of production cost in an amount provided by the plan of the fabricating organization for the year of inception of production of the model and coordinated with the client.

Analysis has shown that in practice all financial relations of the client and fabricator during the process of creation of an experimental model cannot always be included in the scheme of price formation of a specific item. Consequently the mechanism of the financial interrelations of the parties provides in particular that if in the process of conducting operational tests of experimental models, a client finds design or technologically unfinished work through the fault of the organization that created the experimental model, it is to be eliminated at the latter's expense.

It was also established that prices of experimental models are set for a certain number of items (batch), and they are effective only in the course of the year. If in the creation of experimental models design changes or modifications are introduced on the demand of the client or with his agreement and these result in expenditures not provided for in the previously agreed price, a surcharge set in a supplementary agreement of the parties is made.

As the practical experience of sectorial ministries has shown, the operation of this compensating mechanism makes it possible to strengthen the financial status of experimental production installations, which in many cases was unstable because of many alterations of a technical character occurring during the course of a complex and rather long process of experimental work.

With the introduction of a new procedure of payment for work completed by experimental production facilities, conditions were created for shifting experimental production installations in a number of sectors of the national economy to a new system of planning, financing and economic stimulation and, what is particularly important, possibilities have appeared for starting on

the development of provisions on cost accounting for experimental production facilities.<sup>1</sup> In our opinion, they should have for their basis a rather precise mechanism of price formation for basic types of work performed by experimental production facilities.

The experience of the Ministry of Heavy and Transport Machine Building is worthy of attention; its experimental production facilities were the first to be transferred to the new conditions of planning, financing and economic stimulation. For this rules were worked out in advance which provided that the chief task of experimental production facilities is increased efficiency of experimental work, improved financial condition of enterprises and acceleration and quality of fabrication of models of new equipment.

Evaluation of the operation of experimental production installations is founded on the results of fulfillment of the product sales plan, which was created on the basis of experimental work, the plan for a products list and balance profit. The formation of a material incentive fund is a function of the rise or fall of indicators of the volume of sold products and the size of their profit. Sums for the creation and introduction of new equipment depending on the share participation of the experimental production facility are also transferred to these funds.

Practical experience has shown that material stimulation of these production facilities for the fulfillment of indicators of volume of sold production exercises a positive influence on the fulfillment of orders, reduction of their cost and shortening of the time of turning over work to clients.

Negative factors were also disclosed. In particular, it was found that the profit indicator does not always display a proved tendency for growth, since experimental production facilities frequently hike their estimated cost.

Many financial problems exist in the sphere of work of experimental production facilities. Thus according to the data of numerous surveys of the Inter-departmental Commission (MVK) and materials of the USSR State Committee for Science and Technology, the relative share of series production, which is not typical of the products lists of the given enterprises, is still high. This deflects their efforts from the main task--the creation of experimental models of new equipment and retards the process of development and adoption by series enterprises of advanced equipment and technology answering to the requirements of scientific-technical progress.<sup>2</sup>

Under the conditions of the scientific-technical revolution, science is capable of providing a high return only when it is provided with a modern and well-equipped experimental base. For this reason it is so important not only

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1. See "Methodical Rules for the Conversion of Experimental Enterprises of the Ministry of Heavy, Power and Transport Machine Building to the New System of Planning and Economic Stimulation." (EKONOMICHESKAYA GAZETA, No 36, 1972, p 10).

2. See PRAVDA, 21 May 1977, p 2, where detailed statistical data on this problem are presented.

to free experimental enterprises of the output of series production but also to allocate larger financial resources for their development and bolstering.

Nonetheless the majority of sectorial ministries assign insignificant resources for these purposes. For example, for the industrial ministries in 1977, the relative share of allocations did not exceed one percent of the total sum of capital investments. But even these manifestly inadequate funds (according to the data of the USSR State Committee for Science and Technology, they should amount to not less than two percent of all capital investment) are used up as a rule far from completely. Practical experience shows that the percentage of plan fulfillment for construction of experimental shops and experimental installations in all sectors is significantly lower than for capital construction as a whole. Such an unsatisfactory situation must be rectified as soon as possible.

In this connection, it is necessary to hold up the experience of the USSR Ministry of Chemical and Petroleum Machine Building which adopted a decision to allocate each year about 8 percent of the capital investment for the construction of laboratories, experimental shops and experimental units in scientific-research institutes and design bureaus of the sector. As a result, there were put in operation in the last five years 500,000 square meters of engineering-laboratory space and have thus significantly strengthened the experimental base. This has made it possible beginning in 1977 to transfer sectorial science of the ministry to the new system of planning and economic stimulation, including the sector's experimental enterprises.

Of course, it is impossible to have all sectorial ministries aim at such a figure, which naturally reflects the specific aspects of its sector. But the investments of the other ministries whose practice it is to allocate about one percent of the capital-investment sum to the creation of experimental installations are manifestly too low and fail to meet the requirements of scientific-technical policy over the long range.

Unfortunately, some finance personnel still consider allocations for the creation of experimental installations as a form of diversion of resources from the production sphere, although they guarantee a sector's series enterprises in production of new equipment against significant financial losses arising in the initial period.

For reduction of construction time and making experimental enterprises operational, it would be practicable, in our opinion, to provide for first priority allocation of financial resources for these facilities. Underestimation of the role and importance of preferential financing of the creation of an experimental base in sectorial ministries can result in inefficient use of funds allocated by the state for the development of scientific-technical progress.

It is characteristic that not a single ministry refuses to allocate necessary funds for the creation of experimental installations. But when the time comes to build an experimental shop, an experimental unit or an experimental installation, it often turns out that the necessary funds for this have not

been allocated nor has the financial estimate documentation been prepared. As a result one of the chief components of scientific-technical progress--time--is lost.

There is still another aspect of the financial activity of experimental production facilities that deserves the attention of the finance services of sectorial ministries. Numerous checks encompassing all the sectorial ministries involved in machine building and instrument making, carried out in 1976-77, show prices for fabrication of experimental models as a rule are still hiked excessively. This results in an unfounded growth of profits at many experimental production facilities. There takes place in essence an unjustified shifting of financial resources from the sphere of industrial production to the sphere of technical preparation of production. For this reason the Interdepartmental Commission, on examining materials on the work of experimental enterprises of the Ministry of Heavy and Transport Machine Building, promulgated a decision according to which additional sums are directed into the material incentive fund according to the indicator of balance profit only in the case of overfulfillment of the plan within the limits of up to 2 percent; for above-plan profit in excess of 2 percent, this is not done.

Analysis of data for 1976-1977 showed that such a measure was timely and effective. It made it possible to a significant degree to regulate the system of price formation for experimental models and to direct the efforts of collectives of these enterprises to increasing the effectiveness of financial indicators.

Operating on an independent balance, experimental plants and experimental bases rarely use credits of Gosbank SSSR as a source of reimbursement of expenditures and supplementation of working capital. A check showed that only 7-8 percent of experimental enterprises have resorted in recent year to obtaining of credits. Seemingly, not all directors are acquainted with existing instructions that permit them to substantiate and obtain credit. In our opinion, the financial condition of experimental production facilities could be significantly improved with the help of credit.

The Ministry of Finance, Gosbank and Stroybank SSSR have approved a new "Instruction on the Manner of Financing Scientific-Research, Design, Technological Planning Organizations and Settlements for Work Performed by Them."<sup>1</sup> The content of the instruction on the manner of financing experimental work applies completely to experimental plants and experimental bases operating on an independent balance. This instruction greatly promotes the organization of self-financing at large experimental production installations operating on an independent balance sheet.

The existing practice of compiling production and financial plans for an experimental production facility for a single year limits, in our view, the possibility of broader operation of cost-accounting factors. The establishment of basic technical-economic indicators for an experimental production

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1. See EKONOMICHESKAYA GAZETA, No 6, 1974.

facility for a longer period (3-5 years) will increase their interest in the implementation of long-term financial-economic measures aimed at increasing the efficiency and quality of the work of all its sectors. This will contribute to the strengthening of its relative organizational independence.

The practice of sectorial scientific-research institutes and design bureaus of the Ministry of Electrical Equipment Industry, which include experimental production facilities. There was developed and introduced for them a well-based procedure of norm setting of working capital, significantly aiding the introduction of self-financing, particularly the norm setting of reserves of material resources and volume of unfinished production in experimental production shops.

In accordance with the established procedure, the size of the material incentive fund depends on actual economic gains as the result of the use in the national economy of scientific-technical developments and new equipment created in scientific-research institutes, design bureaus and experimental enterprises of a sector. Orientation toward the achievement of a high economic effect and financial indicators from the introduction of developments is an effective factor in the strengthening of self-financing.

In the electrical equipment industry, there has been accumulated experience of economic stimulation of scientific-research institutes, design bureaus and experimental production units included in them. Enterprises utilizing the results of completed scientific-research work and experimental-design work in particular for series production of experimental models transfer a part of the addition profits to scientific-research institutes, design bureaus and experimental production facilities included in them.

Transfers in the amount of 1.5 percent of the calculated annual economic effect from the use of the results of scientific-research work and experimental-design work in a sector but not in excess of 6 percent of estimated cost become a source of accumulations (profit) of scientific-research institutes, design bureaus and experimental production facilities.

The effectiveness of economic stimulation depends to a large degree on how fully and soundly cost-accounting principles are used in the operation of scientific-research institutes, design bureaus, and experimental production facilities. With proper organization of the basis of internal self-financing encompassing the subdivisions of an experimental production unit, the possibility is reached of utilizing more effectively received funds for the material incentive of workers of experimental production facilities.

Differentiation of the sum of a bonus according to the real contribution of workers to the creation of experimental models on the basis of valid criteria will enhance the importance of the stimulating factor in strengthening cost accounting. The experience of using such stimulation is still small; consequently there is a need for conducting a well organized experiment in a large group of experimental production installations of sectorial ministries.

Wider use of the principles of self-financing operation as applied to experimental production facilities presupposes material responsibility for nonproduction expenditures occurring in the course of making experimental models or in the process of their adoption at series plants if it has been established that they occurred through the fault of an experimental production facility.

In connection with the fact that experimental production facilities included under sectorial scientific-research institutes and design bureaus do not have independent balance sheets, their material responsibility may take the form of a curtailment of the share of material-incentive funds which is allotted by sectorial scientific-research institutes and design bureaus for personnel of an experimental production unit. Material responsibility in the interrelations of scientific-research institutes (design bureaus) and experimental production facilities presupposes the use of financial sanctions for disruption of the course of scientific-research work and experimental-design work and respective experimental-design work due to the fault of the parties--scientific-research institutes (design bureaus) and experimental production facilities.

At the present time there are no special normative acts regulating the order and forms of mutual material responsibility of structural subdivisions of scientific-research institutes (design bureaus) with experimental production as applied to cost accounting interrelations. Approved in 1970 by the USSR State Committee for Science and Technology, "General Statute on Scientific-Research, Design, Planning-and-Design and Technological Organizations" does not contain directives on this account. Consequently, in our opinion it would be practicable to prepare an appropriate normative-legal document.

Experimental production facilities, like other structural subdivisions of scientific-research institutes (design bureaus), are not independent creators of new equipment but only constitute a definite part of a single administrative-and operating complex of a sectorial scientific-research institute (design bureau). Their economy is subordinated to the missions facing them. This hinders the preparation of a normative act regulating the manner of imposing financial sanctions within an organization.

Analysis shows that in a number of sectorial scientific-research institutes and design bureaus there have been introduced internal "wholesale factory prices for the work and services of an experimental production facility" without due substantiation. Such a measure does not take into account that commodity-monetary relations are absent in the relations of an experimental production facility with a scientific-research institute (design bureau). An experimental production facility, that is not on an independent balance sheet, cannot be considered a commodity producer in the legal sense and is not an independent administrative unit. Consequently financial relations between structural subdivisions within scientific-research institute (design bureaus) cannot be reimbursable since circulation of economic funds, sale of commodity products and monetary settlements are not practiced between them. Such conditions occur at experimental plants, which have the status of a juridical entity and have an independent balance sheet, a completed production cycle and sell their own products on the basis of operational contracts.

The strengthening of self-supporting operation is connected with a more valid determination of planned and actual production cost of work done. Analysis shows that this problem does not receive the necessary attention at experimental production facilities. The methods used of calculating necessary resources, especially the calculation of wages for specific items do not always reflect the volume and content of conducted work. We know that wages constitute one of the chief cost items going into the price of experimental work.<sup>1</sup> The development of elementary self-financing at experimental production facilities is connected with optimization of planning of their work. In this direction big reserve capacities exist for increasing the efficiency of production. For example, at a number of machine-building sectors conditions exist for calculation of experimental work "on the basis of actual expenditures." Such an approach creates no incentive for reducing the expenditures of experimental production facilities on all types of work and services, since it results in a reduction of the volume of completed work in monetary terms. Consequently, it threatens the fulfillment of the approved plan for sale of experimental products.

For this reason, it is advantageous for an experimental enterprise initially to hike the estimated cost because it is reimbursed by the client. This contradicts the bases of cost accounting inasmuch as experimental enterprises are not interested in lowering the cost of work and services. A way out of this situation can be found with the help of establishment of plan indicators that would stimulate the economic interest of experimental production facilities to fulfill orders at the least possible expenditures while embodying quality and adhering to set schedules.

In our opinion, the realization of such an approach would be possible through the observance of the following conditions. First, the estimated cost of the work of an experimental facility would have to be determined on the basis of sound norms of labor intensiveness and norms of other kinds of outlays and be in accord with the finance services of customers. Second, the volume of sold products should be based on these coordinated estimates independently of the hiking or reduction of actual expenditures following their completion. Third, the main price indicator of the work of an experimental production facility should be considered to be fulfillment of the plan of fabrication of experimental models for the entire approved products list with the attainment of a set technical level for the item.

At the present time, it is possible to speak of the creation of certain prerequisites for the organization of self-supporting operation within the framework of an experimental production facility. Their realization will make it possible to gradually expand the use of self-financing principles in application to these enterprises.

The following is the content of these prerequisites:

a practicable combination of methods of regulation of economic, financial and operational activity of an experimental production facility and granting to it a certain economic independence and rights in the use of labor, financial and material resources;

sounder planning of the expenditure of basic forms of resources used in the course of performance of work and services;

well-organized accounting of the expenditure of all forms of resources in the performance of work and services;

creation of normative documents regulating the interrelations of an experimental production facility and the scientific-research institute (design bureau) in the course of their economic and scientific-production relations.

Self-supporting operation applied to experimental production facilities is a difficult and complex economic problem. Many of this aspects are at present in the stage of development and experimental verification. In this connection, it is too early to give definitive recommendations applying to the entire economic mechanism of these enterprises. We need further theoretical development of the problem and practical verification of prepared recommendations under the conditions of sectorial organizations.

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## 'ROUND TABLE' HELD ON SCIENTIFIC AND TECHNICAL PROGRESS

Moscow PLANOVYE KHOZYAYSTVO in Russian, No. 7, July 1979, pp 97-116

[Article: "An Improvement of the Planning and Stimulation of Scientific and Technological Progress"]

[Text] On 24 April the editors of this periodical conducted a "Round Table" meeting at which an improvement of the planning and economic stimulation of scientific and technological progress was discussed. Representatives from Gosplan USSR, the State Committee for Science and Technology, the State Committee for Prices, the State Committee for Standards, the State Committee for Inventions, of a number of union ministries, and of scientific research institutes took part in the exchange of opinions.

Opening the meeting the chief editor of the periodical P. A. Ignatovskiy noted that in the documents of the party congresses and, especially of the 25th CPSU Congress, the development and use of the achievements of scientific and technological progress is regarded as the chief lever for building the material and technical base of communism.

A powerful scientific and technical potential has been created in our country. Our science and technology is capable of solving the most difficult problems. But, as L. I. Brezhnev said, "the revolution in science and technology requires fundamental changes in the style and methods of economic operations....It requires an improvement of planning and economic stimulation so as to create conditions which will fully promote the most rapid passage of new ideas along the entire chain from invention to mass production and will place a reliable barrier against the production of obsolete equipment....In all of our economic construction there is today perhaps no more important or responsible task."

And, it is clear, that it is now necessary to think about how today, at the junction of two five-year plans when one five-year plan is laying the basis for the other to do everything necessary in order to more fully realize reserves. It is also necessary to think about the problems which will be solved in the more remote future and to use such a rostrum as the periodical of Gosplan USSR to form public opinion and scientific thought about the problems of planning scientific and technological progress.

During the course of the discussion it would be desirable to single out four questions which concern:

The technical level of our output and the possibilities for raising it on the basis of all of the means and directions of improving production, including its unification;

The renewability of output and bringing about an acceleration of this process at least within the limits of established periods;

The relationships between scientific and technological achievements and national economic planning and the reflection of these processes in national economic plans, which presupposes a strengthening of the role of the state and of state influence on scientific and technological progress;

A strengthening of the responsibility of all elements at all levels for an acceleration of the mastery of new equipment and of scientific innovations and, most important, for an increase in the effectiveness of this process.

Of course, these questions do not exhaust the problem being discussed. Nevertheless, it would be desirable if in publishing the materials of the "round table" we could contribute something new to the development of the theoretical work which has already been published and make proposals which might be used in the practical operations of the planning and economic agencies of our country.

The first to speak on the topic under discussion was the division chief of Gosplan USSR K. A. Yefimov. He said that there now exists a sufficiently well-organized and time-tested system of planning the development of science and technology which is an important part of the planning of all of scientific and technological progress. A single technical policy is being carried out in the country under the direct control of the State Committee for Science and Engineering and its results have been especially appreciable in recent years. Thus, the products list of equipment which is one of the most important indicators of an acceleration of scientific and technological progress increased by approximately 15,000 items during the years 1966-1975. During the current five-year plan a further increase of approximately 9,000 items is expected. In addition, during the years 1966-1978 more than 1.8 million units of equipment were modernized. Moreover, whereas during the 8th Five Year Plan an average of 135,000 units of equipment were modernized in a year, during the last three years this number has increased to 158,000 units.

The basic number of overall mechanized and automated lines were put into operation during the last fifteen years. The number of overall mechanized and automated lines in industry which in 1965 came to 49,000 has exceeded 150,000, while the number of overall mechanized and automated enterprises, shops, and sectors has increased by 3.5 times, which also testifies to an acceleration of scientific and technological progress.

It is important to take note of the increase in the number of automated management systems, especially of production processes. By the end of 1978 the country has 3,803 automated management systems of all functions and 1,574 automated management systems of production processes. Thanks to computer equipment, the previously operating system of machines received a fourth controlling element which makes it possible, in essence, to control production with the help of operators and thereby ensure a substantial economy of resources and a rise in labor productivity. At the same time, the problems of a technical improvement of production remain important, and among them one of the most important is the technical level of newly mastered output.

Approximately 70% of the new types of output correspond to the attained world level and, moreover, during the process of certification some of them are frequently excluded. Thus, a substantial number of new types of output predetermined a lower technical level of production.

As a result of this, the necessity is arising for agencies of extra-departmental expertise which would confirm that the problems being studied in the most important scientific and technical research and development ensure the achievement of the necessary level and that production will receive new implements and means of labor which in their technical and economic indicators will make it possible to raise the technical level of production. Such possibilities exist.

The agencies which exist in the State Committee for Science and Technology and in the ministries and departments are capable of organizing a system of extra-departmental expertise, and this must not be postponed. On the threshold of the development of the 11th Five-Year Plan we must be sure that the solutions of the most important technical and economic problems upon which our scientific workers and specialists are working will comprise an important contribution to raising the technical level of production.

At the same time, consideration should also be given to the objective changes in the conditions of production and to the necessity for relocating the extraction of raw material resources to the Far North and East, for increasing expenditures on environmental protection, and for solving the problem of labor resources. All of this demands an accelerated introduction of the achievements of scientific and technological progress.

The 27th Party Congress proclaimed a program of a transition from the introduction of individual processes and machines to process and machinery systems. But as yet the proper organizational and planning solution has not been found which would make it possible for reequipping to be carried out consistently and at sufficiently rapid rates, and not to be drawn out over many years. Moreover, the very concept of system has not yet become an effective instrument at enterprises and in production associations. There is no clear idea about what kind of system is needed, what it is capable of yielding, and on what basis reequipping is being carried out in branches and

in production.

The second problem consists in accelerating the increase in the production of progressive output. Frequently the planning of new equipment after its mastery is conducted for an enlarged products list which becomes dissolved in the overall products list of output. The proper use is not being made of such a lever as the products list which is approved by Gosplan USSR and which includes a substantial number of output items which move from the plan for the mastery of new types of output into the production plans and then into the plans for the products list of series production.

There is the problem of eliminating the lack of unity between the current activities of ministries, departments, and Gosplan USSR and the future development of branches and productions on a new technical basis. The kind of instrument has not yet been developed which would make it possible to follow all of the achievements of science and rapidly include them in the plan. In order for large technical problems to be kept under state control it would be advisable, in our opinion, to select the most important of them and, through special programs, to establish assignments for all topics and include them in the annual plans.

No matter how good the decisions which are made by ministries and departments may be, if they are not coordinated with the plan the result is a lack of unity between the work of the ministry and its enterprises and science which can only be overcome by overall planning. Toward this end, in 1976 indicators of the technical and economic level of production were introduced which make it possible to increase the effectiveness of the scientific and technical development plan and facilitate the optimal use of new equipment and technologies for the production of the final product. But this system is not yet operating in the proper manner. A great deal in it is connected with obsolete methods and the ways of accomplishing a number of major tasks, for example, in machine building, have not yet been found. In this very materials intensive branch there is an enormous amount of waste and the coefficient of the use of metal is approximately .71-.72, although it can be brought to .8-.85.

Apparently, methods have to be found for interesting the relevant ministries in developing a complex of measures for improving technology so as to accomplish these tasks. In other words, we are speaking about the development of a system of indicators which has to be dynamic and carefully reviewed before each five-year plan. Of course, there is no need to have tens of thousands of indicators; but it is necessary for the ones which are used to be made more weighty and effective.

And, finally, the question of stimulation. For the current five-year plan the Interdepartmental Commission at Gosplan USSR has adopted a decision to place the chief emphasis upon such factors as labor productivity and the proportion of the highest quality category output and to put profitability in last place. But, since the allotments to the economic stimulation fund

are made even when there is a lower labor productivity than had been planned, the question arises as to how to compel this mechanism to operate in a different manner so that it will help with the solution of all of the problems connected with an acceleration of scientific and technological progress. This is a large work sector which requires universal attention.

During the course of the exchange of opinions a thorough discussion was devoted to the problems of special-purpose programmed planning of scientific and technological progress and of the interconnections between a program for the introduction of scientific and technical achievements into the economy and the basic sections of the state plan for economic and social development.

V. A. Disson (a deputy division chief at the State Committee for Science and Technology) noted that in accordance with the decisions of the 25th CPSU Congress and with regard to the experience which had been gained, during the 10th Five-Year Plan the use of the special-purpose program method for solving many scientific and scientific and technical problems received development. Thus, the basic assignments for the accomplishment of 200 of the most important scientific and technical programs have been approved in the State five-year plan for the economic and social development of the USSR for the years 1976-1980. They provide for the creation and mastery of new types of equipment, technology, and methods of production organization and management and also for the development of scientific research and development work in the most promising directions of science and technology in order to create a stock for subsequent years.

An analysis of the experience which has been accumulated makes it possible to draw the conclusion that the programs are to a greater extent than the coordination plans oriented toward the final result--the realization of innovations under the conditions of industrial production. There has been an increase in the overall nature of the measures which are necessary for the solution of the problems and in their continuity from research to introduction into production. And, most important, they promote a concentration of efforts and resources on the solution of the most important scientific and technical problems and an accelerated introduction of scientific and technical achievements into practice.

However, the defects and unsolved problems which still exist do not make it possible to make full use of the advantages of the special-purpose program method.

Their coordination with the assignments of the plans for production, capital construction, and material and technical and financial support is an important condition for the effectiveness of the programs. As is known, the assignments of the programs are subject to mandatory inclusion in the state and branch plans and to top-priority support with the necessary resources. However, in fact a number of assignments in the programs are not

provided for by the ministries in their plans, which leads to their failure or to the postponement of planned schedules. This results in a violation of the basic principle of the program method in which the assignments of the programs for the solution of the most important, top-priority problems are primary with respect to the plan. In reality, on the contrary, the measures of the programs and their fulfillment schedules depend upon whether or not the relevant assignments have been included in the other sections of the plans. The failure to allocate the necessary resources, sometimes without sufficient grounds, is regarded as an objective cause for amending the programs. Basically, for these reasons during three years of the five-year plan more than 15 percent of the new equipment objects which had been planned for introduction and created in accordance with the programs were not mastered in production and around 40 percent of the experimental, industrial-experimental, and pilot objects in installations were not put into operation.

The lagging in the construction and commissioning of experimental and pilot objects at which new equipment is developed and introduced is a very important reason for the slow mastery of scientific and technical achievements. Frequently this situation was explained by an insufficient allocation of funds for these purposes--in the range of 25 to 30 percent of the total appropriations for science (applied research gets 60 and more percent). However, calculations show that in the USSR, as approximately in the United States, applied research gets an allocation of around 25 percent and development work more than 60 percent of the total expenditures for science. Thus, it is not the expenditures for technical development work that are insufficient, but the capital investments for the realization and mastery of new equipment. For this reason, there has to be a strengthening of the planned support for the assignments of the programs. It would be advisable to provide for the construction and commissioning of the most important experimental-industrial installations in the state plan and to single out in a separate line the amounts of work connected with their construction in the capital construction plan.

Preparations are now being made for the formation of the five-year plan for 1981-1985. Since resources have to be concentrated on the solution of the most important interbranch scientific and technical problems it is necessary to direct especial attention at their selection for inclusion in the state plan. The work on these problems has to promote a rise in labor productivity, a decrease in materials intensiveness and in specific capital investments, and a thorough increase in the efficiency of social production and in the quality of output.

The problems connected with the creation of fundamentally new equipment and technology require a top-priority solution. As a rule, this demands the organization of new or the reorientation of existing scientific and planning institutions, productions, and sometimes branches and the appropriation of large financial and material resources. For this reason, programs should be worked out for these problems and approved on a state level,

since their solution in the ordinary planning procedure is extremely difficult. Wherever it is possible to manage without them the programs should not be composed, since this only discredits the special-purpose program method. The programs should have included in them problems which are solved by various departments and which require large capital investments and the creation of new capacities, and so forth. If the problems do not go beyond the framework of scientific research and designing work a plan of scientific research work is sufficient for their solution (this, of course, does not apply to research in the most promising directions).

In selecting problems for inclusion in the state five-year plan there has to be a careful examination of the technical and economic level of the new equipment and technology being created in accordance with the programs so that it is not behind the best achievements of world practice. When the most important problems and effective types of equipment and technology are included in the state five-year plan the proposals of ministries and departments should be subjected to expert appraisal. In our opinion, it would be advisable to make this appraisal the responsibility of the groups of scientists who are developing the Overall Program for Scientific and Technological Progress and its Social and Economic Consequences for the Period up to the Year 2000.

The topic of an improvement of the development and realization of the programs is, of course, not exhausted by the above problems; however, their solution should facilitate the solution of the most important scientific and technical problems.

L. I. Maksimov (chief of a subdivision at Gosplan USSR) called attention to the fact that work during the 9th Five-Year Plan testified to the necessity for a most rapid solution of a number of problems which arise in the realization of scientific and technical programs in the localities, and also in Gosplan USSR and the State Committee for Science and Technology. One of them is increasing the activeness of people and overcoming elements of rigidity which hinder the forward movement of technical innovations into production. It is necessary to carry out well-directed ideological work among the specialists of the central state elements, especially the ministries, departments, associations, and enterprises, who direct the development and formation of the programs, organize their realization, and carry out day-to-day control.

As has already been noted, the failure to fulfill programs is frequently connected with the fact that sometimes only a part of the cycle of research and the introduction of new equipment is realized and it is not brought to a final result, that is, the overall nature of the work is violated. For example, an experimental model has been made, but no one is responsible for its further fate and measures are not provided for its mastery and introduction into production. An improvement of overall work in this direction has to follow the line of broadening the horizon of planning and of a greater coverage of the spheres which are connected with the production and introduction of equipment.

The importance of overall work in accelerating the rates of scientific and technological progress was emphasized in the report by Yu. V. Borozdin (director of the Scientific Research Institute of Prices of the State Committee for Prices). He took note of the insufficient degree of overall work both in the work of scientific research institutes and in the practice of applying the achievements of scientific and technological progress.

V. M. Ivanchenko (a deputy division chief at Gosplan USSR) posed a number of questions concerning the interconnections between the basic sections of the plan in the solution of the problems of scientific and technological progress, emphasizing that an acceleration of scientific and technological progress as a decisive factor in the intensification and increased efficiency of production requires a strengthening of the role of a specialized section in the plan for the development of science and technology and of its interconnections with the plans for production and capital investments and the summary indicators of the economic and social development plans. This demand is a result of the necessity for using all of the possibilities and advantages of the planning system to ensure progressive changes in national economic proportions and in the structure and quality parameters of output. The most important thing is for an improvement of the qualitative characteristics of raw materials, semi-finished goods, and finished products to help to accomplish national economic tasks, reduce capital investments for an increase in resources, and remove the strains from economic balance.

In order to raise the technical level of production it is not enough to develop and introduce new equipment and technology models. It is necessary to ensure the series and mass production of new equipment on such a scale as will make it necessary to effectively re-equip the branches of the economy, achieve the overall mechanization and automation of production processes, and produce large amounts of output through the use of the latest technology. Only this kind of approach can ensure overall work and will make it possible to purposefully manage scientific and technological progress by means of the basic sections of plans, balances, indicators, norms, standards, and prices.

First of all, there has to be a substantial change in the content and direction of the scientific and technical development plans themselves and they have to be made to serve as an instrument of the optimal management of the proportions, structure, technical level, and efficiency of production and of the quality of output.

These have to be overall plans of scientific and technological progress which embrace not only the stage of the development, mastery, and introduction of new equipment models, but also the stage of the re-equipment of production on the basis of the latest equipment, mechanization and automation means, and of shifting the production of the basic types of output to modern technology.

In essence, such a plan has to reply to two questions:

What kind of technical level of production will we reach in fulfilling the plan?

What kind of national economic effect is provided for in all of the indicators and norms of the economic and social development plan, that is, how much and what kinds of resources will the state economize?

These questions can only be posed and answered in five-year plans which include the following assignments and programs: a shift to planning systems of machines and sets of them; a rise in the technical level of the branches of the economy; and the re-equipping and reconstruction of production associations and enterprises. And this means that the planning of amounts of production and capital investments has to be coordinated not only with an increase in production capacities and in production potential, but also with its qualitative improvement--a rise in the technical level of production and an improvement of the structure of output.

The system of indicators in the planning of scientific technological progress has to thoroughly characterize the processes of change in the technical level of production and of output, its qualitative parameters, and the economic and social consequences of the measures being carried out. At the present time a wide range of scientific and technical development indicators is being planned, including those which reflect the technical level and quality of output. However, the evaluation of work results and material incentives are based chiefly on the fulfillment of individual assignments for the development, mastery, and introduction of new equipment.

At the same time, the chief issues for the economy remain: supplying its needs for new equipment and technology in amounts necessary for the re-equipping, reconstruction, and mechanization and automation of operating production; outfitting new capacities with equipment; and raising the technical level of production as a whole. This means that the decisive indicators have to be:

An increase in the amount of the production of equipment which meets modern requirements and the introduction of progressive technology, which in appropriate makes it possible to raise the technical level of production to the normed requirements.

An increase in the proportion (in the total amount of production): of output produced on the basis of modern equipment and technology; of raw materials, materials, and semi-finished goods of increased technological readiness; of products of the highest quality category; of progressive types of raw materials, materials, finished output, and their replacement;

A rise in the technical level of the active part of fixed productive capital;

The national economic effect from the complex of assignments for scientific and technological progress calculated in prices, norms, standards, and indicators of the plan and a corresponding decrease in the specific expenditures of all types of resources for the production of finished output.

In order to strengthen the stimulation of an accelerated use of scientific and technical achievements in production and of an improvement in output quality it is necessary to:

Improve the organization of the certification of output quality, and increase the demands on products which belong to the highest quality category; to improve the methods of planning and improving output quality for a five-year period, and also the system of the material incentives for an improvement of quality, including the use of mark-ups for the quality and effectiveness of output;

To strengthen the role of the monies of the single scientific and technical development fund in stimulating the dynamic development of production and of the quality of output;

To expand the use of Gosbank USSR credit for the purpose of scientific and technological progress;

To develop cost accounting relations in the work of scientific research, planning and designing, and technological organizations, associations, and enterprises in all spheres connected with an acceleration of scientific and technological progress.

In his report Ye. V. Sapilov (sector chief at the USSR Academy of Sciences) concentrated attention on the proposals of K. A. Yefimov regarding the institution of interdepartmental expert appraisals of planning and designing work in order to select for production the best new equipment models which have been created on a world scientific and technical level. The selection of the best perfected variants of equipment for development and production is becoming the central problem in planning scientific and technological progress and an improvement of output quality.

As practice has shown, the evaluation and selection of new equipment variants and the awarding of incentives for development workers solely on the basis of the criterion of economic effectiveness does not create sufficient motives for the creation of models which surpass domestic and world achievements in their parameters. For this reason, the economic selection mechanism has to be strengthened with a system of control over the scientific and technical level of the equipment being created, beginning with the planning of its development and ending with its introduction into production.

The state certification of industrial output in three quality categories is, in essence, a passive act of registering the attained level of products which have already been mastered. It does not exercise a direct influence on the formation of the qualitative indicators of equipment which is being designed and on the selection of its best variants.

Expert appraisal of plans is necessary, but, in our opinion, it is an insufficient measure. In order to strengthen control over and increase the demands upon the scientific and technical and economic level of the equipment being created on the basis of an objective evaluation of its parameters in comparison with the best analogues, it would be more effective to spread the application of the state certification of output to planning and designing development work and to certify new equipment in the initial stages of its creation for its planning indicators, that is, at the stage of the development of the technical assignment on planning and at the stage of the organization of production. The certification commission will determine whether a plan accords with the level of the highest quality category.

The certification of planning documentation would make possible a stage-by-stage and systematic realization of a preliminary, intermediate, and final evaluation of quality and the selection of the best variants of the equipment being created; a consistent resolution of the questions of the advisability of expenditures for the development and production of models and for mastery in production; and the making of punctual amendments to plans. The decisions of certification commissions should be included in the planning documentation so that they can serve as the basis for the selection of competing variants.

A. V. Glichev (director of the All-Union Scientific Research Institute of Standards of the State Committee for Standards) devoted his report to the problems of improving the quality of new types of output and of testing it. In his opinion, the following are the general directions of planning an improvement of output quality at all levels of management: the development and mastery of new, high-quality products and their preparation for certification; an increase in the amount of the production and in the proportion of the production of highest quality category output; the removal from production of second quality category output; an improvement of the individual indicators of output quality and of the conditions for its production; and a coordination of the assignments on quality improvement with the assignments of the other sections of the economic and social development plans of the USSR economy and of its branches and the union republics.

An important direction of planning output quality is the establishment of assignments for improving the technical level and quality of output in standardization plans. The State Committee for Standards together with the ministries and departments has begun the development and realization of prog: the overall standardization of the most important types of output in the economy which provide for balanced demands upon the

technical level and quality both of the final output and of the raw materials, materials, component products, and equipment necessary for the production of this output.

During the 10th Five-Year Plan more than 150 programs for the overall standardization of the most important types of output are to be developed and realized. However, the system of indicators and the methods and organization of planning and improving output quality require further improvement.

The lack in production plans of approved assignments to increase the production of highest quality category output (for each type of output in physical terms) and also of assignments which characterize the quality level of the new types of output being developed is a defect in the existing practice of planning. The introduction of such indicators to the body of approved ones will make it possible to ensure a unity in planning an increase in the production of output and improving its quality on the basis of the results of certification.

It is necessary to develop a fundamentally new methodological approach to the planning and improvement of output quality. Toward this end, it is proposed that in the 11th and 12th Five-Year Plans a gradual transition be made from the development and realization of programs for the overall standardization of output to the formation within the state plans for economic and social development of special-purpose overall programs for improving output quality and for their practical realization in order to improve the quality of all types of output to the level of the best world models.

P. A. Ignatovskiy. How can the influence of scarcities on the problems of quality be limited?

A. V. Glichev. I think that with a strict coordination of the balance there should be no scarcities of various materials, raw materials, component parts, and spare parts. In the same manner, the overproduction of some product in order to exercise a reverse influence on an improvement of output quality is excluded. At the same time, the existence of a scarcity cannot serve as a grounds for lowering output quality. On the contrary, it is precisely when there are scarcities that it is very important to ensure high output quality, making use for this purpose of the organizational possibilities of economic management.

Much attention was devoted at the "round table" to evaluating the effectiveness of new equipment and the influence of price setting on an acceleration of the introduction of scientific and technical achievements. In particular, B. F. Zaytsev (Bureau Chief at the State Committee for Science and Technology) expressed the consideration that the economic effectiveness of new equipment is one of the basic planning and economic levers for managing

scientific and technological progress. The formation of technical policy for the development of the economy as a whole and of its branches, associations, and enterprises is carried out on its basis.

The basic methodological principle of measuring the economic effectiveness of new equipment consists in comparing expenditures and results. However, the differences in the content and volume of the expenditures of an enterprise, on the one hand, and of society as a whole, on the other, for the construction of new and the reconstruction of existing industrial facilities or for the creation, production, and use of new machines, production processes, and materials leads to the necessity of determining the national economic and the cost accounting effects.

The national economic effect from the introduction and use of new equipment measured by the annual economic effect in the difference of adduced expenditures is at the basis of the economic stimulation of scientific and technological progress.

It is important to take note of the following. The best technical parameters which are possessed by new machines, instruments and apparatus, and technological processes and materials are the objective precondition for the annual economic effect. The higher they are, the greater the amount of the effectiveness and, consequently, the larger the material incentives for the developers of the innovations. Thus, the annual economic effect is the basic connecting link between the technical level of new equipment and the interest of the scientific workers and engineering and technical personnel of scientific research institutes and designing bureaus in raising it.

At the same time, there are a number of questions here which it would be desirable to consider.

The use of scientific and technical achievements in production has a great influence upon its development and upon increasing its efficiency. Calculations show that in industry as a whole the annual increase in output which is obtained through the introduction of new equipment and through scientific labor organization comes to more than 55 percent, while profits come to around 58 percent of their total increase.

Our associations and enterprises have large reserves for expanding the influence of intensive factors on increasing output production, improving the quality of output, and reducing costs. One of the ways of realizing these reserves is in improvement of material incentives for production collectives for the introduction of innovations. At the present time, the development of production is being stimulated basically on the basis of extensive factors. Thus, the amount of bonuses received by association and enterprise workers for the use of scientific and technical achievements comes to only 1.6-1.8 percent of the total amount of the rewards paid to them for an overfulfillment of planning assignments.

It would be advisable to establish the amount of the incentives funds of associations and enterprises in proportion to the share of highest quality category output and to the increase in profits (or output sales) based on the introduction of new technological processes and mechanization and automation equipment. Compared with the present norms, the material incentives fund should be increased by .3-.5 percent for every percent of highest quality category output and by .2-.3 percent for every percent of increase in profits resulting from the action of the above intensive factors.

The system of material incentives for the introduction of inventions needs to be improved. The annual economic effect which is actually obtained in the economy is the basis for determining the amounts of rewards. Two problems have to be singled out here.

The first is the stimulation of the workers of branch scientific research institutes and designing bureaus who make use in their development work of inventions which have been obtained in academic institutes and in the higher school system, and also inventions by individual specialists. Today they are not being provided with material incentives, and this is having an effect upon the realization of inventions. The question of strengthening the stimulation of production collectives for the introduction of inventions into production is connected with this problem. At the present time their bonuses are fixed in the amount of .5 percent of the economy which is obtained in the first year of the introduction of an invention. This is a very small amount, and in most cases there is no economy at all during the first year.

The second problem is bringing order into the process of paying rewards to inventors. At the present time they are paid over a period of five years from the amount of the actual economic effect whose magnitude depends directly upon the amount of the use of an invention. It is difficult at associations and enterprises to determine actual expenditures and results during these years. What should be taken as the base in the second and subsequent years: the indicators which occurred before the use of the invention, or those of the previous year? There are also other difficulties.

It would be advisable to place a one-time bonus payment which is determined on the basis of annual economic effect at the basis of the system of incentives for inventors for the creation and introduction of new equipment. In our opinion, this would promote a strengthening of the interest of inventors in creating fundamentally new technical solutions and of associations and enterprises in introducing them into production.

The problem of the economic stimulation of the development of scientific and technological progress was developed in the report by Yu. V. Borozdin.

--In my opinion--Comrade Borozdin said,--prices should play a highly important, if not a decisive role in the system of economic stimulation for

scientific and technological progress. Usually the producers of new equipment reprobate price workers for the fact that prices for new and progressive types of machines, instruments, and new materials are very low and do little to stimulate the production of new equipment models. Consumers, on the contrary, believe that the prices for the new types of output which determine scientific and technological progress are high and that they are increasing out of proportion to the increase in use parameters. The problem is arising of an optimal resolution of this contradiction.

I would like to consider a fundamental theoretical and methodological issue--the realization of the demands of the 25th Party Congress regarding the necessity for ensuring a decrease in prices per unit of useful effect from the introduction of new output. This problem is not a simple one, and we frequently encounter contradictions in the views of producers and consumers of the essence of a given category and of the methods of reflecting useful effect in price formation.

One point of view is that useful effect is the increase in the main or a very important parameter, for example, freight lifting capacity, compared to the old parameter which is being replaced. If the price for this very important parameter increases and the increase in the price outstrips the increase in the basic parameter, consumers speak of an increase in price per unit of useful effect. However, producers, as a rule, believe that it is necessary to proceed from the useful effect which consists of the directly measurable (by the aid of expenditures formula) economic effect and indirect effect which consists in the creation of better working conditions (making it easier, increasing safety and the attractiveness of work, and so forth) and in the protection of people and the environment against harmful influences (a decrease in noise, vibrations, discharges of toxic substances into the atmosphere), and so forth.

If we approach useful effect as the total of the two effects, our calculations show that in the vast majority of cases the prices for new products are not increasing per unit of useful effect, but are decreasing. Last year working jointly with the Central Statistical Administration USSR we performed a single survey of several hundred machine building enterprises for their most important types of output. The task was set of studying the dynamics of prices, the changes in the basic parameters of equipment, and the dynamics of useful effect. Out of 30 of the most important groups of machine building output with a total value of 3.5 billion rubles, prices had decreased from 1970 through 1977 for 15 groups.

When the data was worked up on changes in labor productivity, the service life of products, direct and current operating expenditures, and social parameters, the picture proved to be a favorable one for all groups of output. All of the new prices which have been approved during this time period decreased per unit of useful effect. True, when they moved from a group to concrete types of output cases of a relative increase in prices were noted.

In accordance with the Methodology for Determining Wholesale Prices for New Production and Technical Output which was developed and approved by the USSR State Committee for Prices, the calculated useful effect per unit of new equipment is formed from the effect from an increase in its productivity, an increase in its service life until the first capital repair, a decrease in direct current operating expenditures, changes in the additional capital outlays of a consumer connected with purchases of accompanying equipment, and the creation of the appropriate conditions for the use of the new equipment instead of the replaced equipment (accompanying capital investments). Social factors--an improvement in safety, working conditions and so forth--are also considered in evaluating the useful effect from the introduction of new equipment.

An analysis of data for machine building output for a number of years shows that more than two-thirds of the useful effect is made up of an economy of current operating expenditures and less than one-third of the effect from the increased productivity of new equipment. In general, the remaining components of useful effect do not exceed three to five percent.

This kind of situation causes one to reflect. First, the relatively low productivity growth rates of new equipment compared to the replaced equipment (from 5 to 20 percent in machine building as a whole) indicates that the technical improvement of many types of machines and equipment is carried out by the evolutionary method, on the basis of the use of old designing principles. Secondly, the preponderance of an economy of current operating expenditures in the calculated amount of useful effect is not fully confirmed in many cases by the data on the actual effectiveness of the use of new equipment. Thirdly, statistical reporting is not conducted for all of the components of useful effect and, for this reason, it is difficult to judge the real national economic effectiveness of new equipment and, in relation to it, build a system of incentives for cost accounting elements (enterprises, associations).

It follows from everything that has been said that it is necessary not only to improve the mechanism of measuring and planning useful effect, but also to use this category (through the system of price mark-ups) for stimulating scientific and technological progress. The real profit-forming factor becomes not one or another type of expenditure by the producer (the full cost of component products or the cost minus the cost of materials, net or conventionally net output, and others), but the national economic effect which is obtained by the consumer from the use of new improved quality output.

With this approach, the amount of the economic effect has to become one of the cost accounting indicators of evaluating the work of enterprises and find a reflection in the planning and reporting indicators of their work. In other words, it is necessary to determine not only the designed or planned but also the actual effect and to fix its magnitude in the relevant accounting and statistical reporting. The development of scales for

determining price mark-ups in relation to the extent of an economic effect which are differentiated for bracketed and output groups is an important task.

It is important that the amounts of the wholesale price mark-ups which are received by enterprises do not "drown" in the overall financial indications of their work, but be assigned in definite amounts to the economic stimulation funds. This is the path followed by the practice of price setting in which up to 70 percent of the amount of the wholesale price mark-ups for production and technical output remains at the disposal of enterprises, thanks to which they are interested in renewing output and improving its quality. Unfortunately, to date we have not succeeded in solving the problem of establishing wholesale price discounts for second quality category output, although it is obvious that the mechanism of stimulation with the help of mark-ups should be supplemented by a mechanism of de-stimulation with the help of discounts.

Wholesale prices have to play a special role in creating an interest in enterprises and associations in decreasing the materials intensiveness of output. Two paths may be followed here. First, to leave the level of prices unchanged for producers when there is a decrease in the expenditure of materials and the maintenance or even improvement of output quality. Secondly, to lower wholesale prices, maintaining profits based on prices in full measure, when there is a substantial decrease in costs. Both of these paths are now being tested in industry.

Mr. V. Sosilov: The establishment of wholesale prices is a condition but not a fact in obtaining economic effect. Why does the State Committee for Prices not establish an expenditures norm or a wholesale price per unit of the useful effect of a machine in operation right away? This would create a barrier to the penetration of inefficient equipment into production, people would begin to reject it.

Mr. V. Borodulin: We have a mechanism to effect for determining the ceiling price. In particular, in documents which were approved by us jointly with the State Committee for Standards, for example, in the information map for the development of MTK [expensive unknown] and prices there is a ceiling and a planned price and the effect. We believe that this is sufficient for developing new equipment models at all stages. There are proposals to include in the price list prices that take account of the effect in operation. But how such prices will operate in reality and what the mechanism of their operation is is completely unknown.

Mr. V. Sosilov: The price workers should provide us with this mechanism.

Mr. V. Borodulin: The actual effect can be recovered only in the sphere of use. Neither the necessary reporting nor normal monitoring exists today. Let us at least organize reporting on actual effect. For example, according to the regulations, a machine tool was supposed to ensure an effect

of 1,000 rubles, but it yields 100 rubles. Let us seek the reasons why this has occurred.

Developing the topic of the stimulation of scientific and technological progress, B. D. Motorygin (Deputy Division Chief of the State Committee for Science and Technology) noted that the state encourages its acceleration by various methods. There are two systems in the country for the economic stimulation of the mastery and introduction of new equipment which can conventionally be called the old one and the new one.

The old system was formed in the early 1960's. Monies for incentives for the workers of scientific organizations and enterprises were formed in this system in relation to the amount of the wage fund of the participants in the work to create, master, and introduce new equipment. The presence of work in an approved plan and its fulfillment were the conditions for the payment of bonuses. The amount of a bonus for the introduction into production of the results of scientific development work depended upon the amount of the economic effect which was received.

The new system of economic stimulation for the creation, mastery, and introduction of new equipment provides for the formation in scientific organizations of three stimulation funds in relation to actual economic effect. At the basis of the system is the proposition that the material incentives of the workers of the scientific organizations which create the new equipment and of the enterprises which master and introduce it have to be made directly dependent upon the economic results of the use of the new equipment in the economy.

The results of the introduction of a new system of economic stimulation for work on new equipment in 15 industrial ministries (including 11 machine building ministries) testifies to the fact that it ensures an acceleration of scientific and technological progress. Thus, in the Ministry of Heavy Machine Building from 1972 through 1977 the economic effect from the introduction of new equipment increased by 2.3 times, the proportion of highest quality category products in total output production increased 3.3 times, and the economic stimulation fund increased by 2.2 times.

The new system of financing the development of science and technology is also playing an important stimulating role in accelerating scientific and technological progress and increasing its effectiveness. It provides for the formation in a ministry of a single scientific and technical development fund instead of the previous sources of financing; the state budget, the ministry's scientific research and development fund, and the new equipment mastery fund. The single fund is a cost accounting source of financing--it is formed on the basis of norms with profits from production operations.

Note should also be taken of the shift to financing the solution of branch overall problems through a head scientific organization (scientific center) and of interbranch problems through a head ministry (department) which is responsible for the solution of the problem. In this case monies are expended more purposefully; control of work results is more careful; and the possibility appears for a flexible redistribution of monies among work stages. No less effective is the practice of the Ministry of Electrical Engineering Industry of paying for scientific research and experimental designing work on the basis of the results of finished work, instead of advanced financing and stage-by-stage payment.

An improvement of the financing of the creation, mastery, and introduction of new equipment requires:

the financing of work through a single scientific and technical development fund;

an increase in the rights of head ministries (departments) and of a head scientific organization (scientific center) in managing scientific research and experimental designing work for which they are the responsible executors for the purpose of more widely disseminating the principle of financing through these ministries and organizations;

an expansion of the practice of paying for research and development on the basis of their final results and the creation of a methodology for this purpose of forming prices for the final results of research and development.

If course, without increasing the responsibility of all of the participants in the creation, mastery, and introduction of new equipment for the functional and high-quality performance of work it is impossible to accomplish the tasks which have been posed. It should be kept in mind that stimulation is not only material incentives for the results of work, but also the application of harsh measures of economic influence--fines, the removal of bonuses, and so forth.

Ten years of experience in managing scientific and technological progress in the electrical engineering industry, the administration chief in the Ministry of Electrical Engineering Industry B. Ye. Astaf'yev noted, shows a necessity for creating a single overall system whose essence consists in having all of the elements of the economic mechanism (organizational forms, planning, output quality control, financing, price setting, material stimulation, the use of profits) ensure the integrity, coordination, and continuity of the entire cycle of "science-equipment-production-consumption." An overall approach is necessary for the solution of the problem of accelerating the rates of scientific and technological progress.

One of the important characteristics of the system which is operating in the branch consists in the fact that the national economic effect from the production and use of new equipment has become an object of calculation,

analysis, planning, and accounting for the first time. Practice has shown that the selection of new scientific and technical solutions for introduction and the validation of the branch's technical policy and of the rates and proportions of the development of science and technology have to be performed only with regard to national economic effect. In this way a connection is ensured between the technical solutions which are adopted and the economic evaluation of their national economic usefulness, which improves the final result of the development of science and technology.

Compared to 1968, in 1978 the national economic effect from the introduction of new equipment increased by more than five times.

The overall system for managing scientific and technological progress in the branch has made it possible to shorten the time periods for the development of an introduction of new products by 1.5 to 2 times. The proportion of highest quality category output and the total production of products which are subject to certification increased from 12.2 percent in 1968 to 55.9 percent in 1978.

The present system of cost accounting indicators directs enterprises toward an increase in sold output, profits, and profitability. But with an expansion of the production of new products which are highly effective for the economy in most cases these indicators are lowered, which leads to a decrease in the economic stimulation funds. To a substantial extent this situation is a result of the fact that the system of economic indicators (production volume, labor productivity) for industrial enterprises takes insufficient account of changes in the quality and technical level of output, and also of the national economic effect which is obtained by a consumer when he uses new equipment.

In the electrical engineering industry the path has been taken of reflecting a part of the economic effect from the use of new types of highest quality category products in the economic indicators. For this purpose, in planning and reporting the commodity output growth rates are determined by means of recalculating the amount of the commodity output of a base year by a coefficient which takes account of the effectiveness of new highest quality category output compared to the output being replaced. When use is made in production of less expensive materials and substitutes and of more productive processing methods (without worsening quality indicators) as a result of which the wholesale prices for finished output are lowered, or when new, cheaper output is produced which is equal in its technical and economic parameters in quality to the output being replaced or surpasses it, the wholesale prices for this output are determined with regard to maintaining the amount of profits which were obtained from the sale of the previously produced (replaced) output. In addition, in order to determine the amounts of production and of labor productivity before the end of the five-year plan the wholesale prices for the output being replaced which have been adopted in the plan are employed. Incentive mark-ups are in effect during the entire period that the product retains its State Token of Quality.

In our opinion, these measures make it possible to accomplish a number of tasks and, especially, to strengthen the interest of enterprises not only and not so much in renewing output as in the long-term production of the best quality and most efficient products; and to create the economic conditions for an interest in decreasing labor and materials intensiveness and replacing expensive raw materials, materials, and component products with cheaper ones.

K. G. Fedorov, the Director of the Scientific Research Institute for Technical and Economic Information of the Ministry of the Chemical Industry, acquainted the meeting's participants with the experience of employing a new system of planning and economic stimulation for scientific and technological progress in a branch. He noted that the scientific and technical problems which are planned by the branch occupy a decisive place in the financial and labor expenditures of the branch's overall scientific and technical plan. Thus, the proportion of expenditures for such measures in the branch plan of the chemical industry comes to 75 percent of the single scientific and technical development fund, while in other branches it is even higher.

Scientific and technological progress is a complex process which requires an overall solution of all problems. To a substantial extent this kind of overall approach to the management of scientific and technological progress is ensured by a new system of planning, financing, and economically stimulating new equipment work which was tested at first in the electrical engineering industry and in three scientific research institutes of the chemical industry, and then within the entire Ministry of the Chemical Industry and in a number of other branches.

A strengthening of the influence of the new system not only on the economic indicators of new equipment, but also on its scientific and technical level is an important aspect. Thus, the chemical industry has been the first among other branches to introduce a procedure of differentiated bonuses for the introduction of new equipment measures in relation to their scientific and technical level. All of the development work is subdivided into three levels: A--on a world level, B--domestic inventions, C--all others; correspondingly, when work of different levels is introduced the allotments to the incentive funds were established in the amount of 10.5, 9, and 6 percent of the total economic effect.

In planning scientific research and experimental designing work for schedule orders the emphasis has been put on the quality of the work. Patent and scientific and technical characterizations in which the ways of achieving the original scientific result are determined is a component part of the scientific research and development plan. This compels institutes and industrial associations to conduct patent surveys and to evaluate the scientific and technical results of work.

This kind of overall influence on the quality of development work by means of planning, stimulation, and scientific research and experimental designing work has made it possible to achieve appreciable results. Thus, during the period of the new system's operation (1975-1978) the number of inventions created every year in the branch increased by 1.7 times, the introduction of inventions increased by 1.8 times, and the economic effect from their introduction also increased by 1.8 times.

Overall work in planning scientific and technological progress has to be complied with both in the branch and on an interbranch or interdepartmental level. This is especially important for the chemical industry, since around 70 percent of the economic effect from the introduction of scientific and technical achievements in this branch is obtained outside of it. The branch is interested not only in the most rapid development and production of new output, but also in its effective use. Consequently, it is necessary to make up scientific and technological progress plans for related branches, providing in them for the development of new chemical materials in accordance with agreed upon technical specifications and for their production and use within agreed upon schedules. Such plans which are approved by the joint orders of two ministries have been made up in the Ministry of Electrical Engineering Industry, Ministry of Light Industry USSR, and others. This has made it possible to accelerate the solution of the problems of supplying the branches led by them with new chemical materials.

The overall planning of scientific and technological progress with regard to its related stages has given a good account of itself in the form of a system which has been created in the branch of organizational and economic relations with the organizations of the Ministry of Chemistry Industry, USSR Academy of Sciences, and the academies of sciences of the union republics. For the purpose of organizing joint work in the individual regions of the country, the Ministry of Chemical Industry has created at the relevant academies special subdivisions which carry out the planning, control, and organization of the introduction of joint work and, in necessary cases, the organization of experimental testing, and also calculations of the economic effectiveness of this work and substantiations of its financing and encouragement. All of this has made it possible to use the large scientific potential of the branch for its development.

E. Z. Bunatyan, a Division Chief at the State Committee for Inventions, devoted his report to the material and moral stimulation of the use of inventions.

An analysis of the use of inventions in new equipment projects shows that in recent years most of the projects which are planned for introduction by the state plan for economic and social development are not based on inventions and do not contain them. Thus, only one-third of the new equipment projects which are being mastered in accordance with national economic plans contain solutions of technical problems on the level of inventions. In addition, a survey has shown that most of the topics in

the state plan make use of many "obsolete" inventions.

It is essential to solve a fundamental problem--to unite in material stimulation the interests of the developers of new equipment, of inventors, and of persons who assist inventions.

It appears that, first, we have to see as inseparable a strengthening of material incentives for the creator of an invention and for the persons who help with the use of inventions in development and production; and, secondly, the actual national economic effect has to be taken as the base in determining all types of rewards for the creation and use of inventions, including lump-sum incentives rewards and bonuses for assisting inventions. Moreover, the bonuses for assisting inventions should be paid as close to the beginning of introduction as possible.

The present system of multiple payments to the creator of an invention--when the creator's certificate is issued and then annually for five years--is very complex and does not meet modern requirements. The new proposals provide for the payment of a creator's reward to inventors in the form of an incentives reward (simultaneously with the issuance of the creator's certificate), an advance when a decision is made on the planned use of an invention, and an additional payment up to the full amount due to the creator as the actual national economic effect is obtained.

In addition, it is being provided for that the amount of an incentives reward has to be determined according to the principle "the higher the level of the inventor's creativity and its useful consequences for society, the greater the amount of the reward." For this reason, it would be advisable to improve the system of payments of incentives rewards for inventions whose use can lead to the creation of fundamentally new equipment or can serve as a basis for an equipment project or a basic element of it, making them directly dependent upon the amount of the national economic effect measured in rubles.

These changes in the payment procedure make it possible to strengthen the stimulating role of rewards, since they permit punctual and fuller incentives for inventors and development workers--the creators of new equipment which is up to the world level or surpasses it.

Consideration also has to be given to the question of improving the system of determining the amounts of bonuses for new equipment which has been made dependent upon the existence of inventions. As an analysis of certain research projects has shown, the existing norms scale for the establishment of the amount of a bonus for new equipment depending upon its annual economic effect is organized on the following principle: with an increase in the effect which is obtained the minimum and maximum percentages of the bonuses are lowered, while the amount which limits a bonus increases from 2,000 to 200,000 rubles, and so forth. It is necessary to strengthen the stimulating role of bonuses for the creation and introduction of new equipment by means of a differentiated scale for the amount of a bonus depending

upon the existence of inventions and new equipment and upon the amount of the economic effect yielded by it.

The participants in the meeting touched upon the questions connected with an improvement of the training of scientific cadres in the higher school and with the organization of the work to improve the management of scientific and technological progress. Examining these questions, V. D. Kanayev (Doctor of Economic Sciences, Professor at the Moscow Higher Technical School imeni N. E. Bauman) said: an acceleration of scientific and technological progress demands a change in the character and structure of economic information. First of all, the political economy course in technical vuzes has to be improved. Today its structure differs little from the course which is given in economic vuzes. But in the economic vuzes the political economy course is developed in special courses in which there is also a detailed analysis of the economic policy of the CPSU. In the engineering vuzes there are no special courses, and in the 140-hour political economy curriculum practically all of the attention is devoted to methodological and theoretical issues, with insufficient time remaining for a description of the issues and economic policy. This does not promote the economic training of our future commanders of production or the formation of a Marxist-Leninist world view in them.

It is necessary to create a political economy course for technical institutes taking account not only of the fact that it is the base subject with respect to concrete economics, but also of the fact that enterprises and scientific research institutes expect that a young specialist will be able to conduct propaganda work among the workers. At the same time, the interconnections between political economy courses and concrete economics have to be strengthened. A single cycle of economic training has to be formed in which there is an examination of the economy as a whole, and its national economic interbranch complexes, branches, and enterprises (associations). The next important question in the training of engineering cadres is planning the number of students in technical institutes. We have outstripped the United States by more than three times in the number of diploma engineers in our economy, but there are many hidden reserves in the use of our engineers. Frequently engineers in industry are employed in jobs which do not require a higher education. At the same time, there are not enough specialists with top qualifications for the non-production sphere. The structure of training cadres through the higher school requires improvements.

An improvement of the quality of the training of engineers is of no less importance. The accomplishment of the task of uniting the achievements of the scientific and technological revolution and the advantages of socialism which was posed by the 24th and 25th CPSU Congresses requires that engineers who are employed in the most responsible jobs in the leading branches, at industrial enterprises, and in other spheres of the economy receive a higher education in institutes where more favorable material and other conditions are created for scientific and instructional work. As is known a large

group of vuzes was recently singled out as a leader in the field of scientific research. It appears that the necessity has arrived for singling out a group of leading technical institutes, for example, with a lower staff coefficient and with the best conditions for classroom and laboratory work.

Speaking during the course of a discussion of the questions which had been posed, the division chief at the All-Union Scientific Research Institute of Systems Research of the USSR Academy of Sciences and the State Committee for Science and Technology D. N. Bobryshev noted that now, when an enormous scientific and technical stock had been created, it is extremely necessary to have a reliable organizational and economic mechanism for introducing and disseminating advanced experience in management in the field of scientific and technological progress. Despite their importance, solutions which apply to individual large or small problems are becoming insufficient: it is important to move from individual measures to the development and realization of a single integrated system of measures.

This kind of work has been begun in the State Committee for Science and Engineering's Scientific Council on the Problem of "The Organization and Economics for Scientific and Technical Research and Development Work by Scientists and Specialists of the All-Union Scientific Research Institute of Systems Research of the State Committee for Science and Engineering and the USSR Academy of Sciences." A special "Program of Work on an Improvement of the Management of Scientific and Technical Development" is being formed within the framework of the general conception being developed. The program is supposed to contain a single interconnected system of measures and to provide for the necessary research, methodological development work, managerial experiments, the preparation of directive documents, and the procedure for introducing a system of measures in all of the elements of the management system in the sphere of science, technology, and production. The goal of the development and realization of the program is to improve the quality of management so as to make more effective use of the country's scientific and technical potential.

The system of measures in the program is distributed along three levels of management: the highest--central agencies; middle--department, all-union industrial association; lowest--scientific organization, scientific-production and production association, enterprise.

The system of measures is united by a general direction of ensuring the effective management of the single cycle of "research-production-use," but, at the same time, account is taken of the specific nature of basic and applied research and development work and of the mastery of new equipment in production and by the consumer. The system of measures in the program is systematized for the following basic directions:

an improvement of planning as the central element of management; the organization of management systems, including structure, the distribution of tasks, responsibility, the rationalization of information connections, and the use of equipment in management.

It is advisable in planning to develop and carry out measures to improve the mechanism of selecting directions for scientific and technical development, for a regular selection of important scientific and technical problems at all levels of management, the realization of a special-purpose programmed approach in the formation of plans, and also to develop their overallness and interconnectedness both for stages of the "research-production" cycle and for the hierarchy of the management system.

The basic idea in the field of the development of a management system is the development of an interconnected and integrated system of methods for every level of management. This idea has to be realized in combination with economic, organizational (administrative), and educational (socio-psychological) methods. Of especial importance at the current stage is an improvement of the methods of managing the quality of the work of researchers and development workers and the quality of scientific and technical results.

In the field of the organization of a management system the proposals which are being worked out have to make it possible to unite measures for an improvement of planning and management methods. In the process of the realization of general management schemes for the branches of industry and in the introduction of the special-purpose program approach to the organization of research and development relationships change between the developers as to the methods of organizing research, development, and the introduction of new equipment. The necessity arises for a clearer connection between planning and reporting indicators and the changing structure of the system for the management of scientific and technical development and for an improvement of coordination and control of the fulfillment of plans in the sphere of science and technology.

The development and realization of the program will make it possible to successfully solve the problem of improving the management of scientific and technical development and to increase the efficiency and quality of the work of the ministries, departments, organizations, and enterprises which are responsible for an acceleration of scientific and technological progress. In addition, there can be a strengthening of the responsibility of leaders for the creation of advanced equipment, technology, and materials and for their introduction and wide dissemination in the economy.

K. A. Yefimov delivered the concluding words. He said that all of the speakers agreed with the fact that our basic attention has to be devoted to the effectiveness of final results. Today effectiveness is being measured by concrete indicators--a decrease in the cost of output and the conventional release of labor resources. The task of increasing production efficiency through scientific and technological progress is, in essence, one and the same task both at the state and at the branch levels.

For this reason, it is very important to define which measures have to be included in the methodological instructions and normative documents for

the basic directions of the following five-year plan so that it will be possible to ensure a fuller unification of science and planning and the use of scientific and technical achievements in the economy. We are extremely interested in the work which was spoken about by D. N. Bobryshev. We shall hope that the All-Union Scientific Research Institute of Systems Research will be able to attain its goal. We are faced with a large amount of work for the practical realization of the achievements of scientific and technological progress. This demands a coordination of the work of ministries and departments and of all of the specialists working in this field.

Summarizing the reports of the participants in the meeting at the "round table," P. A. Ignatovskiy noted that the discussion of the problems of scientific and technological progress was characterized by an overall approach to their consideration which, unfortunately, is still lacking in reality. A number of the concrete proposals in the reports of the participants can serve the development and substantiation of concrete measures in planning and managing scientific and technological progress. Of course, the considerations expressed at the "round table" do not exhaust the wide range of problems in the development of scientific and technological progress. However, at the same time, they can serve to unite the efforts of scientists, production organizers, planning workers, and specialists in the various branches of the economy in developing and realizing proposals aimed at the solutions of the major problems of scientific and technological progress.

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